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Gleanings in Bee Culture



VOL. XLI. APRIL 15, 1913, NO. 8.

Gleanings in Bee Culture

One Year

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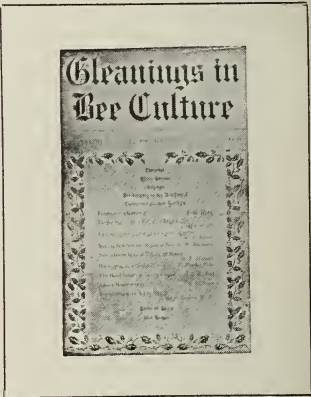
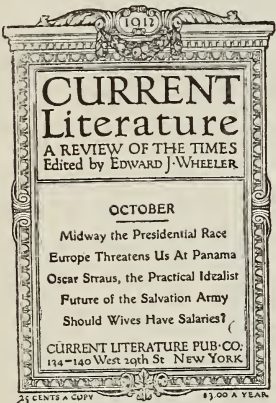


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VOL. XLI.

APRIL 15, 1913

NO. 8

Editorial

OUR COVER PICTURE.

THE view seen on our cover for this issue shows a part of the apiary of August de Malachowski, whose illustrated article appears on another page. In the foreground is shown the old model of the hive "Elita," as it appeared in 1909. The brick tenement hives are also shown, each of which contains four colonies.

"A BATTLE WITH BEES."

AN article under the above heading appears in the December issue of the *Wide World Magazine*. The story was told originally by Mr. Philip J. Baldensperger, an apiarist in the Holy Land, and reported by Frederick Lees. The article is intensely interesting, and any of our readers who have an opportunity to get a copy of this magazine will make no mistake in reading it. The article is illustrated by some beautiful engravings of colonies of bees loaded on camels, of Mr. Baldensperger's apiary, etc.

WHY A LIGHT MOTOR TRUCK FOR OUTYARDS.

WE recently purchased a small motor truck capable of carrying 1000 lbs. to be used in connection with our system of out-apiaries. The reasons we use a comparatively small machine are, low first cost, low upkeep, quick trips, and often. A large truck carrying two or three thousand pounds would be heavy and unwieldy. It would cut deep into meadows and fields where the apiaries are located. A light truck will carry as much aggregate weight in a day or a week, because it will go oftener. This is important, because the men should keep in close touch with the yards. Our general plan is to have a crew of two or three men take care of all the yards. If time is money it is important that these men be transported to their work as quickly as possible. During the height of the season a motor cycle in addition to the truck will carry a man from one yard to another to look after

swarms, cells, or other work of that nature, in a very short time.

We are just now distributing our 600 colonies around in fruit-orchards. The fruit-men are asking us to put bees on their ranches; and, of course, it is to our interest to put them there. Our plans are now to have seven or eight yards—possibly more; and the advantage of a small truck capable of carrying 25 colonies at a time is that it can move the bees at any time to pastures new. In one particular case we expect to move 100 colonies to a fruit-ranch of between sixty and seventy acres of fruit-trees ten miles distant. There is little or no clover in that locality. When the season of fruit-bloom is over it is our intention to move to where much alsike is grown. Four trips will move the whole yard of 100 colonies in less time than it takes to move with a two-horse team, because the distance will be great. Our experience is that a team, driver, and apiarist, will take about a whole day and sometimes into the night to go after a yard of forty colonies eight miles away, and bring them back home and put them in the cellar. That same bunch of forty colonies could easily be moved with a motor truck capable of carrying a thousand pounds on two trips in less than half the time; and, what is more, it is sting-proof.

We have studied this question from a good many different angles; and the more we study it, the more we believe a *light* truck will be much better than a heavy one that will tear up the soil in getting to and from the yard.

A CAUTION ABOUT SENDING HONEY OR PACKAGES OF BEES BY PARCEL POST.

THE ROCKY MOUNTAIN BEE Co., in this issue, asks for information on how to send honey by parcel post. The matter is of such importance that we thought best to give our reply here. While it is perfectly practicable to send eggs, comb honey, and other fragile articles for a short distance, say for rural delivery, we doubt whether it is advisable to try to send such articles any

distance by trolley or steam roads. Our experience so far has shown that comb honey sent by parcel post has broken down in almost every case, even when well packed. The entire package or packages on arrival are one dauby mess, and the probabilities are that every thing in the mail-sack in which these packages came must have been daubed more or less. Similarly, nearly every parcel-post package that has been sent us containing liquids of any large quantity has been broken or leaking; and it seems to us it will be only a very short time before Uncle Sam will stop the shipment of liquids, syrup, and honey, especially comb honey, unless more precaution is used.

We presume we have had as much experience in shipping small samples of comb honey by express as any people in the United States. Our plan has been to wrap up two or three sections in paper, then in excelsior in a market basket, being careful that there was plenty of cushion or packing material between the fragile articles themselves and the baskets. As a general rule, commodities can go in a basket by express when they can not be shipped any other way; but parcel-post rulings do not allow a handle to a basket; but a basket may be used if the handle is folded down or cut off.

One difficulty about the parcel-post business is the fact that all packages go inside of a mail-sack. A big heavy package up to the 11-lb. limit bumping against a light one is almost sure to be disastrous to the latter, especially if it contains any fragile article such as comb honey or eggs.

In view of our experience, both with express shipments and parcel post, we would strongly advise against shipping comb honey by parcel post. It is conceivable that a single section might be sent as a sample; but it should be wrapped very thoroughly in paper, then in excelsior, and last of all inclosed in a strong wooden box that is capable of resisting a severe bump from an eleven-pound package in the same sack. But even then the section of honey should be wrapped in heavy manila or paraffine paper to catch the leakage if any.

We would at the present time discourage sending even *extracted* honey by parcel post, especially for long distances. It would be very unwise to put up a single package of, we will say, eight pounds of extracted honey in a box weighing only three pounds. About the largest amount that can be shipped would be in a five-pound tin. This should be wrapped thoroughly in excelsior in such a way that the excelsior will not

become displaced and leave a vulnerable spot for a severe bump. After wrapping it in excelsior it should be crowded into a basket with the handles folded down or cut off, and the top covered with a thin board and thoroughly tied with strong cord. But we do not believe there is one person in a thousand who knows how or can wrap up comb honey so it will go through to its destination by parcel post. Even Dr. Miller can't do it. See his *Straw* in this issue.

It is to be hoped that Uncle Sam will see the importance of keeping out of the mail-sacks bulky and heavy packages that just come inside of the eleven-pound limit, for it is certain that heavy packages should be left outside of the sack. Even though a higher rate were charged to cover the extra handling, it would not then be possible to ship bees in pound packages by parcel post. While there is no difficulty in sending a queen and a dozen or more of her attendants by mail, it is an entirely different proposition to send one pound of bees, or approximately 4500 individuals, in a closed mail-sack. "It can't be done." If that same Uncle will permit bees and other live stock like chickens to travel in wire cages or crates *outside* of the mail-sacks the same as express our problem would be solved.

THE NEW EDITION OF OUR A B C AND X Y Z OF
BEE CULTURE.

THE last form of this work for 1913 is just coming from the press. We have been at work on it for the last year and a half, and now we have it ready for the public. The new edition contains 750 pages, or 150 more than the former one. On account of rewriting so many of the old articles, and the incorporation of many new ones, making the book so much larger than formerly, we are now obliged to charge \$2.00 instead of \$1.50; but we believe that the reader will acknowledge that it is cheap, even at that price. Approximately it contains nearly 600,000 words. Any volume of this size on a technical subject like beekeeping would ordinarily command a price of \$5.00; but now, as in the past, we much prefer to make a small profit per volume on a large sale rather than a large profit on a small sale.

The new edition has been most thoroughly revised by E. R. Root, ably assisted by Dr. C. C. Miller, of Marengo, Ill., the veteran comb-honey producer; by Arthur C. Miller, of Providence, R. I., banker and beekeeper; by John H. Lovell, of Waldoboro, Me., naturalist, botanist, and entomologist; and by Prof. Eugene G. Baldwin, the one

who wrote that interesting series of articles on Florida beekeeping a year ago.

Up to now the old editions have been printed on standing type; but the extensive additions and revisions made it necessary to discard the old type which was becoming worn, and adopt a new scheme for getting out this work. To do this we purchased a \$4000 linotype type-setting machine, which also handles all the composition in *GLEANINGS* and our subsidiary publications.

The fact that the new edition was to be entirely reset, from beginning to end, made it possible to make the revision much more thoroughly than had ever been undertaken before. In many cases, instead of patching new matter on to the old it seemed more practicable to rewrite the articles entire. A notable example of this will be found in the case of foul brood. The former edition contained six pages, while the new has sixteen. In the same way, other old subjects were rewritten, while with many other subjects it sufficed to make mere changes and additions here and there. There will also be found an entirely new set of articles that never appeared in any edition of the work.

A notable feature of this last edition is the bee botany, which was entirely overhauled, and in many cases entirely rewritten, by John H. Lovell and Prof. E. G. Baldwin, mentioned above. The subject of Pollen and the Pollination of Flowers was almost entirely rewritten by Mr. Lovell. We doubt if there is another man in the country who can handle these subjects more ably than he. Dr. C. C. Miller to a great extent rewrote "Honeycomb." He also made important suggestions (which were adopted) on the subject of comb-honey production; and well he might, for he is now regarded as one of our best if not the best authority on the production of honey in sections. Mr. Arthur C. Miller, who for so many years made a close study of the internal economy of the hive, made numerous suggestions, many of which were adopted and incorporated in the text. In other cases, where he might or might not have differed with the author and reviser, his notes were put in the form of footnotes at the bottom of the page, and signed "A. C. M." In a similar way will be found an occasional footnote signed C. C. M. (Dr. Miller). The unsigned footnotes are by the author.

At first thought, as one glances over the new volume and observes that two-thirds or three-fourths of the matter was written by E. R. Root, he will wonder where A. I. Root comes in, and whether it is a case of "Hamlet with Hamlet left out." We are happy to say this is not the case. Some of

the best things that A. I. Root ever wrote on bees (and he wrote a good many) still appear in this volume, and always will. It is not so much because his writings have been stricken out of this edition, but because the immense amount of new stuff made necessary by the growth of the industry has made A. I. R.'s material seem small in comparison. His familiar style will be recognized, for example, in *Absconding Swarms*; *After-swarms*; *Anger of Bees*; *Artificial Heat*; *Artificial Pasturage*; *Bee-hunting*; *Bee-moth*; *Italian Bees*; *Queens*; *Robbing*; *Stings*. What he has written under these heads will always remain as classic in bee culture. No man had more enthusiasm in the study of bees than A. I. Root, and that enthusiasm is so conspicuous that his writings can usually be picked out of the other matter, even though they have been skillfully interwoven with matter written by others.

Another feature of the 1913 edition is special articles by special writers. That is to say, we have sought the best writers we could find on any particular subject. Note, for example, the articles written by Prof. A. H. Bryan, of the Bureau of Chemistry, Washington, D. C.; by Dr. E. F. Phillips; Dr. Snodgrass; Dr. James A. Nelson; Dr. D. B. Castell—all of the Bureau of Entomology, and all experts in their line.

For several years back we have been looking for a botanist who is also a beekeeper, a naturalist, and an entomologist—a man who has done an immense amount of field work—one who has secured his information first hand. We finally found such a person in John H. Lovell, whose work seems to be accepted by some of the best scientists in the country. He has prepared most of the bee botany in this edition; and from a scientific standpoint we believe it will be up to standard.

Taking every thing into consideration, we feel proud of our new A B C and X Y Z of Bee Culture. It is new from cover to cover. It is the work of experts in their respective lines. It is the largest and most comprehensive bee-book in any language in the world; and yet it is sold at the popular price of only \$2.00. It will be clubbed with *GLEANINGS IN BEE CULTURE* at \$2.50. Old subscribers desiring to secure the new edition of the A B C and X Y Z of Bee Culture can, by the payment of \$2.50, advance their subscription one year and yet secure a copy of this magnificent work. It is so much of an improvement, so much of an enlargement over any of the previous editions, that one who owns an old copy can well afford to secure the new volume.

Stray Straws

DR. C. C. MILLER, Marengo, Ill.

THE man who winters bees in a cellar will cast a longing look toward outdoor wintering as soon as he begins to establish out-apiaries.

As an experiment I sent by parcel post to Chicago 10 sections of honey, none of them perfectly finished, in a safety shipping case. Postage was 46 cts.; expressage would have been 30 cts. Only four sections were unbroken, and the honey was reported "on the run." [See editorial.—Ed.]

OUT-APIARIES afford an extra chance for improvement of stock. The best colonies can be massed in the home apiary, or one of the out-apiaries, and queens can be reared there with a better chance to meet the best drones. Then when the young queens are laying they can be distributed to the other apiaries.

P. C. CHADWICK, p. 174, complains that the cost of parcel post for honey is prohibitive beyond the first zone. Perhaps hardly so bad as that; for in zone 2, with nine times as large a territory, it's only 4 cents a pound; but it's not what we should have. From here to Chicago, 66 miles, 7 pounds costs 30 cents by parcel post; by express 25 cents. Eleven pounds costs 46 cents by parcel post; 30 cents by express. Uncle Sam can work for as little as the express company, and ought to.

A GOOD many, at least in Europe, take seriously the idea that larger bees can be produced by using foundation with larger cells. No less than 2500 Rietsche foundation-presses have been sent out with 736 cells to the square decimeter instead of the usual 854. That is, the cells were made with about one-sixth greater area than usual. [Does a large cell make the bees any larger? We doubt it. If, however, the cells are smaller than the normal size, the bees will be smaller, just as a Chinese woman's foot is made smaller by being put in a small shoe. As Cheshire has pointed out, there would be no advantage in having a larger bee, as such an insect would be out of harmony with the flowers for which they seem to be specially adapted by the great Creator.—Ed.]

REPRESENTATIVE LEWIS, one of the most interested members of the congressional committee on parcel post, favors this rate: Three cents a pound for the first pound, and half a cent for each additional pound up to 100 pounds for the first hundred miles, then half a cent additional per pound

for each additional hundred miles. By the Lewis rate a package of 12 sections, weighing, say, 14 lbs., would cost 10 cts. within 100 miles, and 17 cts. within 200 miles. Exactly this may not come; but something like it is likely to come before beekeepers are ready for it; for I don't know of any proper package ready for posting honey—do you? [There is a great future for parcel post; but before honey or bees can be shipped in that way some provision will have to be made whereby they can be sent like ordinary express matter in separate packages by *themselves* instead of in a closed sack. Bees in pound lots would smother in a sack. In a jumble of packages in a sack, large and small, comb honey would stand a poor show.—Ed.]

It is well known that cold favors granulation of honey, but it is not so well known that frequent change of temperature may be a still stronger factor. In *Ill. Monatsblatter* is given an instance, p. 21. Buckwheat honey in cans was set out where the sun shone upon it by day and it cooled off at night. In three or four days it began to candy, while in the steady temperature of a room honey out of the same lot remained liquid for weeks. [You say it is "not so well known that frequent changes of temperature may be a still stronger factor" in causing honey to granulate than cold. Those who have read late editions of our A B C and X Y Z of Bee Culture—yes, for five years back—must have seen where we have said that "the primal cause of granulation is the alternation of warm and cold weather." See subject of "Candied Honey." Then toward the latter end of the subject see this: "Continued zero weather is not so favorable as weather somewhere near the freezing-point, now moderating up to the thawing-point, then freezing and then thawing. When the weather remains continuously cold, set the honey out in pails or boxes in a room where the temperature goes a little below freezing, leaving it for a day or two, then move it into a warm room." At various times in these columns we have stated that changes of temperature will cause granulation much sooner than mere steady cold. As a rule you can leave liquid honey in a temperature 10 degrees below zero for weeks, and it will remain as clear as crystal. But a freezing and a warm temperature in alternation, day after day, for about a week, will begin to show results in that same honey. We therefore entirely agree with *Monatsblatter*.—Ed.]

SIFTINGS

J. E. CRANE, Middlebury, Vt.

The so-called "pickled brood" has at last a definite descriptive name—"sac brood." It has also been discovered that it is to some extent infectious, as I have feared it might be. The United States Department of Agriculture has just sent out Circular 169 of Bureau of Entomology, fully describing the disease. This is the disease I spoke of on page 21, Jan. 1.

* * *

Dr. Miller quotes from *Deutsche Bienen-zucht*, page 4, Jan. 1, regarding the necessity of a brood-chamber so bees can cluster in a sphere. A spherical cluster of bees in winter is not necessary where the brood-chamber is well packed. I often winter bees on four combs, and small nuclei on three combs, with success. It is always well to reduce the size of the brood-chamber to the size of the colony.

* * *

The editorial in regard to the color and temper of Italian bees is golden. I was much interested in a remark made to me by Mr. Frank Alexander, of Delanson, N. Y., last spring. He said he didn't like cross bees. I have had some experiences the past year in inspection work that I don't care to have repeated. I have found some that I wouldn't keep if you would give me a whole yard for nothing, set in the richest pastures flowing with honey.

* * *

On page 8, Jan. 1, Mr. Doolittle discusses the prolificness of queens vs. longevity of bees; and he appears to have the argument on his side. It was a favorite theory with Napoleon that Providence favors the largest armies, and we beekeepers have been working on that principle very largely. The condition of a colony will often influence the amount of work done. A new swarm will sometimes accomplish twice what it did before swarming. I could not help wondering, after reading Mr. Doolittle's statements, whether there is any thing to hinder our having both a prolific queen and long-lived workers combined in the same colony. If we add to these gentleness and honey-gathering instincts, we shall have almost ideal bees.

* * *

From a Straw on page 40 it would seem that Dr. Miller and Mr. Morley Pettit do not think alike on the subject of European foul brood. Well, never mind. I have no doubt they would if they lived in the same locality and kept the same race of bees. A

great deal has been laid to locality in bee-keeping, and I have come to the conclusion that locality plays quite as much a part in European foul brood as in any thing else. In some sections it spreads with great rapidity, but slowly in others. For several years it has existed within two miles of one of our yards, but as yet I have not found a trace of it in our yard. It appears far less contagious in some sections than others. I remember one yard I inspected where it had been for two or more seasons without spreading beyond these two or three colonies. In low damp or hot localities it seems much worse than on high land or in a colder and dryer climate. I have noticed a decided difference in different yards in the same locality. Some strains of bees appear to be almost immune, while others succumb to it very quickly. I believe at the present time it is of much more importance to breed a race of bees that will contend successfully with this disease than to breed for the largest number of yellow rings on their abdomens.

* * *

Of immense importance is the editorial, page 38, Jan. 15, on the value of windbreaks for winter protection for outdoor-wintered bees. I have called the attention of the readers of *GLEANINGS* to this subject several times, and should have said more, but did not want to be considered a crank on the subject; but when I see every colony dead in that part of a yard most exposed to the prevailing winds I know that this exposure had much to do with the wintering of bees. For many years in locating a yard of bees on a new site I have considered protection from the wind quite as important as a good range or pasturage for the bees. We winter almost entirely out of doors; but like other good things, this matter of protection may be overdone. Mr. Halter wisely calls attention to this on page 56, Jan. 15. I have known a yard almost completely ruined by too much protection. A friend of mine built a high tight fence on the northwest and south sides of a small yard while his house was on the east side; and when the bright sunny March days came the bees flew, most of them never to return to their hives. The protection should be such that, as soon as the temperature of the yard becomes much warmer than the outside air, the air of the yard will rise, and the cool air from outside will quickly take its place, thus keeping the temperature of the yard near that outside.

Beekeeping in California

P. C. CHADWICK, Redlands, Cal.

The women's number of GLEANINGS was a nice one, and I should like to make some comments on their ideas; but I have been a married man 17 years, so I pass.

* * *

Mr. J. W. George, at the State convention, asked why the cotton of Imperial Valley does not yield honey. It occurred to me afterward that it must be due to the nectar being very thin and the climate very hot and dry, causing a condition much the same as in the orange districts when extremely hot weather causes the rapid evaporation of the thin nectar from the orange bloom.

* * *

J. E. Crane, p. 57, Jan. 15, says: "The ignorance of the great mass of beekeepers is past comprehension. So far as I can learn, not more than one in six, in some sections, ever read a bee journal of any kind." This reminds me of a friend who invited me to dinner with him while at the recent State convention. On our way to the cafeteria he frankly (I like these frank open-hearted folks) opened his heart to tell me he had criticised me at a certain meeting for making a statement much like the above, saying he thought I was a little severe in the matter. Now Mr. Crane reports the same from his travels, and even a little worse. Bro. Crane, if any one has his doubts about the matter, let him take a similar trip and be convinced.

* * *

Western migratory beekeepers should study the question of shipping bees without combs. The problem of having their bees quarantined, as some of our western beekeepers have had theirs, might be overcome by having two sets of hives and combs, and shipping the bees from one locality to another in full-swarm packages without combs. At a reasonable express rate it might be cheaper and fully as profitable to have a full swarm to begin on an alfalfa flow as to have a hive containing mostly brood to begin the work; for if I have been correctly informed it is a difficult matter to get the old bees through when transporting them with the hives and combs. The greatest difficulty would be when shipping back for the orange-flow, which would have to be done in the fall immediately after the alfalfa season was over, and to get enough natural stimulant to start a force of young bees for early spring breeding. The stores for winter could be reserved at the end of the orange-flow. I believe it would be worth a thorough trial at any rate.

I have read with interest the discussion as to whether we should encourage more to keep bees or render more help to those already in the business. My idea on the question would be to offer first aid to those in the business, and not encourage those not in to go in, for there is going to be a continuous line of young enthusiasts enter from year to year, and they are the ones who need encouragement. Enthusiasm is half the battle, and is necessary to success in this line of business. One poor season will cure a bad case of bee fever where there is no enthusiasm to complicate the case; but where there is this complication, you may as well count the case incurable, and give every aid possible to the patient. I believe the teaching of apiculture in agricultural or even in high schools would be a most excellent line of knowledge for the general information of a public that has little or no knowledge on the subject compared to other lines of knowledge. If we could overcome such expressions as "rob the bees," "strained honey," and "bee gums," it would give a little higher conception of the business. I feel, however, that we are outgrowing those expressions to some extent.

* * *

A correspondent recently wrote me, saying the brood-chambers of his hives were honey-bound, and asked what I would do to relieve the situation. Circumstances enter very largely into the case any way you may figure it. If, in my judgment, they had sufficient bees to cover an extra comb I would slip one in the center of their brood-nest, expecting the queen to lay it full of eggs at once if the breeding season were at hand. Then I would watch developments. If the eggs were laid as expected, and honey coming in but very slowly, I should expect that to relieve the situation; and if, after the larvæ in the new comb had reached the stage where they were demanding the most stores, there should come two or three days of bad weather I would clap my hands and say, "Good! eat it up," for that would give them additional relief. But if honey were coming in freely, and there were only a limited time until the main flow was at hand, I would extract some of the combs to relieve the situation and give the bees a chance to start brood-rearing as rapidly as possible. If there were very much brood started, and bad weather expected, I would be very careful to leave them plenty of stores to carry them safely.

Beekeeping in the Southwest

LOUIS SCHOLL, New Braunfels, Texas.

WORKING BEES BY MOTOR-BOAT.

Not all beekeepers are so fortunately situated that they are enabled to carry out certain advanced ideas on a large scale. One of the chief ones of these is the management of big strings of out-yards by means of the automobile. This is prevented by two main reasons, as a rule—the lack of suitable locations on one hand and the want of better roads on the other, or both. Fortunate is the one who can locate any number of apiaries in easy access from good automobile roads. That is one of the greatest essentials in real up-to-date extensive out-apiary management to-day. Of course this has no reference to the smaller number of apiaries owned by many beekeepers who are successful with that number.

Grant Anderson, of San Benito, Texas, well known as a queen-breeder, has made use of two automobiles for a number of years. He uses a light high-wheeled buggy, motor-driven, as a roadster in which to run to the various apiaries and other places when no hauling is to be done. For hauling trips he uses one of the light high-wheeled delivery wagons. These have given him excellent service and satisfaction, especially for pulling through muddy and sandy roads. In this respect the high-wheeled machines seem to have an advantage.

Recently we have been informed that Mr. Anderson has now all, or nearly all, his apiaries located on the banks of a river, and runs from one to another in a motor-boat. This would indicate still another step toward "hastening" beekeeping work in the management of large and numerous out-apiaries. It is to be hoped that the readers of GLEANINGS may be favored with an article and photos, showing this man's doings per motor vehicles and motor boats, for we have written Mr. Anderson to give us information.

* * *

A COLD SNAP.

While we have had quite a cold winter in Texas this year, there was not much severely cold weather. The cold weather was much more evenly distributed than during most of our average winters, and only occasionally did it get so cold that standing water was frozen over, and then only to a thickness of less than an inch.

During the last two months there was much warm weather during the middle part

of the days; but as a rule the nights were quite cold. The latter did not affect our early bloomers, however; and, in fact, there were all evidences that spring was here in the fore part of March. This has reference to the central part of the Lone Star State, the northern part having had still colder temperatures. Against this, however, southwest Texas was enjoying real spring weather; and reports from the more southern portions of this territory were to the effect that bees were storing honey rapidly enough to keep them too busy to swarm. It will be remembered that a honey-flow at swarming time stops all, or practically all, swarming in our part of the South; hence these reports show that quite a honey yield must be on to prevent the early swarming that may safely be expected at this time, with a moderate yield of nectar and pollen.

However, after all this beautiful weather and brightest prospects for a spring crop, the temperature dropped suddenly to 28 degrees on March 15; and the result was disastrous. Especially did it affect the fruit bloom, which was in full blow. As a consequence, the fruit crop will necessarily be short again this year. While the bees were materially affected by the destruction of this source just at a time of heavy brood-rearing, yet the beekeeper may safely figure on a somewhat better market for his products than when fruit is very plentiful. Although some beekeepers do not seem to think that this has any effect on the honey market, our own experience has shown time and again that there is a sudden slackening in the demand for honey as soon as much fruit reaches the markets.

We do not know how much the bees were affected. There was considerable young brood; and, owing to the warm days previous to the cold snap, the bees were scattered out of cluster so that, as a consequence, brood was not protected properly against the suddenness of the cold wave. In addition to this there followed several days of cold weather, preventing the bees taking proper care of all the brood. Therefore we found some colonies carrying out some dead brood on the following warm days. All in all, however, the damage does not seem to be great, especially to those beekeepers who are paying close attention to the great amount of stores now needed by the heavy brood-rearing colonies.

Conversations with Doolittle

At Borodino, New York.

WEALTH-PRODUCERS.

"Mr. Doolittle, I came over to have a little chat with you about the middleman as a wealth-producer. We are hearing much at the present time about the high cost of living. Does not every one of the dealers add to the cost of living without producing any wealth? This question was brought up to my mind when I was thinking of buying my bee supplies for the coming honey harvest. I find that, as a rule, I can get these goods no cheaper of the dealer than of the manufacturer; but the dealer must have quite a large slice out of the pockets of some one in order that he can be allowed to live in idleness. Why I say idleness is because a prominent political economist told me the other day that a trader or dealer adds nothing to the real wealth of society."

"Suppose we ask the question, What is production? and who are the producers of wealth? Take, for instance, the section material we need for use when we are engaged in the production of section honey. The man who takes a plank of wood and cuts section material from it is not the only producer who has brought human energy to bear upon it. The man who cut the tree up in the north woods of Michigan or Canada helped to produce that section. The man who drew the log to the mill, and the sawyer at the mill who sawed the log into plank, and the transportation company who transported it to the manufacturer of sections; the party who took the finished sections and put them down where they were to be used, and the man who received them and held them in his storehouse until the beekeeper was ready to exchange the fruits of his labors for them, all had a hand in the *production* of those sections.

"Let us go a little further: Every one who put forth any energy in getting the section to the place of consumption was a producer of sections so far as that section and the individual consumer were concerned; for to leave any of them out would deprive the consumer of his sections at the proper time and place. You live in central New York, and the section was made at Medina, Ohio, we will say. That section would be of no use to you until it found its way to central New York. And it seems almost ridiculous for me to say to a man of your intelligence that this section could come through the regular channels of trade cheaper for you than in any other way. It is true that you might stop work and walk out to Medina and bring the section back

in your pocket; but I will not insult you by saying that such a method would prove more expensive than to have it carried by a 'soulless railroad corporation' at the direction of the so-called 'useless middleman.' No: the dealer is not an idler by any means.

"Let us look at the finished product of our section honey for a moment. Where did such production begin, and where did it end? Are the bees the producers, or is the man who manipulates the bees the chief and only factor in the production of honey in sections? When is this production completed? and when does the act of production cease and that of consumption begin? Is it not plain that production ceases when the honey is in the hands of the consumer, and not before? If this is so, then every man or woman who had any part in getting the honey in the hands of the consumer is a real producer.

"Then there is a point as regards the dealer in honey, which is almost always overlooked. The dealer, as a rule, helps create a desire for our finished product, and, therefore, has much to do with the production of section honey. Whatever satisfies human desire can properly be called wealth; and if there were none desiring our honey it would, to say the least, be a useless production which we should be in. There must be a desire for our finished section honey before it can be called wealth; therefore the dealer or 'drummer' who creates a desire for our product must of necessity be called a producer.

"It is apparent from this that the dealer is valuable in more ways than one. He not only helps to sell our product by creating a want for it, but he brings goods to the point of consumption at less cost than they could be brought by the consumer, and at a saving of time. He keeps on hand ready for the consumer such goods as he may want, and at the time he wants them. This relieves the consumer of all anxiety and responsibility, and he has the use of the money up to the very time when he is ready for the article he needs. The nearer the article is to him when he is ready for it, the longer he can wait before he gets it. The dealer has to assume all the risk; and any man who knows anything about the honey business knows that this is no small item. There is a possibility that we may have too many dealers—that some of these dealers are over-reaching and unwise. But it is sometimes well to ask ourselves these questions, else we become uncharitable."

General Correspondence

SUGAR SYRUP VS. HONEY

Mr. Byer Makes his Position Clear, and at the Same Time Shows that he is in Harmony with the Rest of the Beekeeping World

BY J. L. BYER

GLEANINGS for March 1 is just at hand; and as I read the editorial comment regarding that note of mine concerning the value of *syrup* as compared to good honey as to *lasting* qualities, I rubbed my eyes and hastily turned to "Notes from Canada" to see what foolish things I had been writing to put me "practically in opposition to all the rest of the fraternity." Now, while I would rather enjoy being in such a unique position as that, if sure that I was *right* and all the other fellows wrong, in this case I have not the slightest idea that such is the case, as I personally know that a large number of extensive beekeepers who have to feed lots of sugar every fall are right in line with me on this question. In the first place, I want to say that, *all* things considered, I do not think there is any thing quite so good for bees—certainly nothing better—than first-class honey sealed in the combs. Secondly, I believe that for our cold climate there is nothing in *general practice* that we can depend upon for safe wintering so good as thick syrup made from the best quality of sugar; and I am and have been right along an advocate of heavy feeding for winter if we wish to be sure of wintering successfully in our cold climate. Why this apparent contradiction? Simply because, under modern methods of extracted-honey production, we can not have any great quantity of first-class honey in the brood-nests after the supers are off. Indeed, in most cases there will be little honey of any kind; and what there is will be of late gathering, which is usually inferior to clover or basswood honey for wintering purposes. The saving of combs of clover honey for winter is not practical, and is not economical when colonies are kept by the hundred; as, for the winter months alone, good well-ripened syrup is equal to or better than the best honey. For spring I prefer the honey by all means, especially if the weather is too bad to allow free gathering of pollen.

Now, while I am right with the editor as regards the advisability of feeding sugar syrup for winter stores, the point of difference is the comparative values of a pound of syrup in a feeder versus a pound of good honey already sealed in the combs. I say

that it takes a pound of sugar in a feeder to equal a pound of sealed honey, while he contends that a pound of *syrup* has this value. The word "syrup" is very indefinite unless density of the same is mentioned; and whatever he may have had in view, I am referring to a syrup made of two parts of sugar to one of water, that being the proportion I always use for fall feeding.

While I have no *figures* to back up my contention in this matter, a lot of actual experience, often with a lean pocketbook to make me very careful in the matter, has convinced me thoroughly that it takes a pound of sugar when made into syrup, and fed, to equal a pound of sealed honey; and I now always figure on that basis when preparing for winter. If any one wishes to try the experiment in a simple way he can try the following, as I did more than once when at different times I had bees given to me in the fall, the owners not wishing to feed up colonies practically destitute of stores. This was when I was getting bees wherever I could, and at a time when they were more easy to get than is now the case. Strong colonies of bees were shaken on empty combs, and brought home to be fed up for winter. In some cases, when I had combs of honey on hand, they would be given these; but generally I had to feed them sugar syrup for wintering. At that time I believed that two-to-one syrup was equal, pound for pound, with sealed honey; but I soon got my eyes opened on the question. I would feed these destitute bees the 30 lbs. of syrup made by the two-to-one plan; and every time I would have to look after those colonies in the early spring to prevent starvation, while the colonies with 30 pounds of sealed honey would have enough to carry them through. After a few experiences of this kind I began to investigate; and while I believe that a pound of syrup sealed in the comb will equal at least a pound of honey, that is an altogether different proposition from saying that a pound of syrup in a feeder equals a pound of sealed honey, as we all know that 30 pounds of syrup will not weigh nearly that much three weeks after it has been given to a colony. This shrinkage is very heavy—just why, I can not say definitely; but I suspect that quite a bit is lost in wax secretion, as whenever bees are fed they seem to secrete wax scales, whether comb-building is necessary or not. So as a matter of fact a colony fed a given amount of syrup is not as heavy to start out with as is the colony with sealed honey in the hive equal in

weight to the one we endeavor to bring up to standard by feeding syrup. Any one testing this must be sure that they have the amount of *honey* to start with, as very often about 20 pounds of honey and 10 pounds of *pollen* pass for 30 pounds of honey.

As I said at the start, I personally know that many of our heaviest producers now agree with me on this question; and, indeed, it is not so many years ago that I contended that thick syrup in a feeder equaled sealed honey pound for pound. Mr. John Newton, of Thamesford, Ont., was arguing with Mr. Sibbald and myself at a convention on this matter, and we both disputed his claim vigorously when he claimed that a pound of sugar was necessary to equal a pound of sealed syrup; but much against my will I have been forced to agree with him; for in so far as the purse is concerned, I certainly wish that such were not the case. But even on the basis of a pound of sugar to equal a pound of sealed honey, we still get mighty good value for the change. Just now, if I had good honey to sell I could easily get 12 cts. a pound for it, and I can buy the best granulated sugar wholesale at $4\frac{1}{2}$ cents a pound.

In conclusion, then, I certainly advise and practice feeding syrup for our cold winters, both as a matter of security and economy; but I am perfectly satisfied that for "our locality" it takes a pound of sugar mixed with half a pound of water to equal a pound of good sealed honey.

Mount Joy, Ont., Canada.

[When Mr. Byer in his department on page 141, March 1, put out a challenge to the editor in this language, "Surely you do not believe that a pound of syrup will go as far as a pound of good honey?" and then further on in the same item says, "While I have to feed lots of sugar syrup some falls, certainly I do not place that proportionate value on the syrup as compared with honey," we naturally concluded he was making the comparison under *like conditions*. That is to say, we thought he was contending that a pound of sealed honey in the combs was much superior to a pound of sugar syrup sealed in the comb; but in the article above he now makes it very plain that what he meant was that a pound of syrup before it is fed would not equal a pound of honey sealed in the combs. This being his position we nearly agree with him. We do not know, however, that we are quite prepared to believe that it takes a full pound of sugar, when made into a two-to-one syrup in a feeder, to equal a pound of honey sealed in the combs. A good deal

would depend on what time of the year this syrup is fed. If it were very late in the fall, when it is cold, and were given in one large feederful, say 25 lbs., our opinion is that the loss would not be as great as he estimates. If, however, he fed this two-to-one syrup early in the fall, then we are quite prepared to believe that it would take fully a pound of sugar in the feeder to equal a pound of honey sealed in the combs. All in all, we doubt if there is any difference of opinion between us, now that we understand each other. In all events, we are glad to place in this connection a short item from Mr. R. F. Holtermann, who supports the position taken by Mr. Byer.—Ed.]

Regarding the value of honey and sugar syrup, I consider that, from experience with honey and syrup side by side, as a winter store the sugar syrup is the safer winter food for bees. If, however, we feed and want a colony to gain, say, 20 lbs. of stores, I estimate the quantity by the number of pounds of sugar in the syrup rather than the weight of the syrup. For instance, if I want a gain of 20 lbs. I take 20 lbs. of sugar, and make it into a syrup, and feed it to gain the desired weight. The percentage of waste is greater when a less amount is fed, and in my estimation (and I act on this in practice) I never think it worth while to feed less than 10 lbs. of syrup with the object of securing a gain in weight worth while. Rapid feeding is also desirable to keep colonies from starting brood-rearing, and to prevent unnecessary waste in storing and ripening the syrup.

Brantford, Ont. R. F. HOLTERMANN.

HONEYBEES AND POLLINATION

The Wind of Little Value in Pollinating Fruit-trees

BY GEORGE H. WEST

The conclusions of all eminent horticulturists agree on the necessity of the honey-bee in orchards for effective cross-pollination, large fruit crops, and perfect fruit. The result of exhaustive experiments and observations, covering over twenty years, shows that most of our tree fruits are self-sterile—that is, they either produce no fruit from the pollen of their own blossoms (or that from the bloom of the same variety), or but a small amount of fruit, and this largely under-sized or defective. Self-pollination would be such as the wind might give, while cross-pollination would be bloom fertilized by the pollen from other varieties of the same species, and by insect visitation.

Waugh, of Massachusetts, demonstrated

that plum pollen is not transmitted through the air in sufficient quantities to ensure self-pollination. Profs. Lewis and Vincent (Oregon State Agricultural College, Bulletin No. 104), experimented with plums, and reached the same conclusions. Their experiments on the action of the wind in apple pollination with varieties known to grow abundant pollen at the height of their bloom, and with a strong wind blowing, showed no effective deposit of pollen twenty feet from the trees and nine feet from the ground, nor thirty feet away, and at a height of six feet.

The writer's belief, from observation of some forty years in Colorado, where we have much wind, is that the winds are a positive damage to effective apple pollination. We have often observed apple trees that had little or no fruit on the north and west sides (from whence our prevailing winds). The deduction was that the pollen and petals were blown away. But we noted, also, later, that *bees rarely visit blossoms when the pollen is gone*, hence no proper fertilization and little fruit. For verification we cite the experiments of Lewis and Vincent, where all the petals and stamens were removed from the 1500 blossoms on a seven-year apple tree, leaving it exposed to both the wind and insect visitation. This tree was 20 feet from another that bloomed profusely. *Out of the 1500 blossoms emasculated, only five set fruit.* During the whole period (days) that the pistils of these blossoms were receptive, only eight bees visited the tree. More than twice that number were seen in one half-hour on the tree twenty feet away.

Certainly the forest trees and bushes, and most of our field crops, seem to secure proper pollination by the winds; but all authorities now agree that our tree fruits secure it effectively only by insect visits. If the theory is true, that all bloom which, in the economy of nature, supply nectar, *require* insect visits for effective fertilization and reproduction, then the bees which gather honey so largely from alfalfa clover *are a necessary factor in growing alfalfa seed.*

Prof. M. B. Waite, United States Department of Agriculture, Bulletin No. 5, "The Pollination of Pear Flowers," made experiments to determine the value of insect visitors in pear pollination. Of 36 varieties of pears tested on 142 trees, only nine proved self-fertile above five per cent. The experiments showed a great increase, both in the yield and size of the fruit, from cross-fertilization. Waite says, "It has been proved that cold weather, during the flowering pe-

riod, renders some plants incapable of self-fecundation, although they still retain the ability to be cross-fecundated." Observations by growers in Indiana and Utah confirm the truth, also, that cross-pollinized apples have more vitality to resist freezing weather and insect and fungous injury. Waite says, "Apples are more inclined to be sterile to their own pollen than the pears. * * * In the majority of cases no fruit resulted from self-pollination."

The experiments of Prof. S. W. Fletcher, Virginia Agricultural Experiment Station; of Prof. A. J. Cook, Horticultural Commissioner of California; of Profs. Lewis and Vincent, and others, all reach the same conclusions. They give little value to pollination by wind, and all give due credit to the busy bee. Fletcher's experiments showed that Bartlett pears, on 3081 tests fertilized with their own pollen, *produced only six small pears, or one fruit to 513 blossoms*; while with pollen from other varieties it grew one fruit from seven to ten blossoms, and these pears were over fifty per cent larger in size. Also, the Kieffer pear, on 1268 blossoms fertilized with its own pollen, *grew but five fruits, or one to 263*; while on cross-pollination, with other varieties, it yielded one fruit from three to seven blossoms.

In the Lewis and Vincent tests, self-pollinated Spitzenberg apples proved inferior in size, and ill-shaped, compared with the cross apples, and were practically devoid of plump seeds. On the yellow Newtown apple tests the results were the same, except that the average weight of the seeds from the cross-fertilized apples *was forty-six times greater* than from the self-fertilized fruit. Imperfect pollination can not produce perfect fruit. It is often "lop-sided."

Oregon circular bulletin No. 20 says, "Careful experiments have shown that very little if any pollen of our tree fruits, other than nut-trees, is transported by the wind. Probably 99 per cent or more of the transfer of pollen is done by insects. Prime among these may be mentioned the honey-bee."

The Bureau of Entomology, Washington, says the annual value of honey produced in the United States is \$20,000,000; but that *the service the bees render in fertilizing the blossoms of fruit trees is worth many times twenty million dollars a year.*

The bloom period of tree fruits is very short. The winds waste the pollen; the rain washes it from the blossoms, and drouth injures it. The pollination period is often greatly shortened by rains or cloudy days, when the bees do little work. For their

greatest effective work, the *hives of bees should be in the orchards*, and perhaps near those varieties that are the heavy pollen-bearers. Some honeybees work at night in Colorado and Idaho. Growers there think one average hive of thrifty bees for each two acres of mature orchard necessary for effective pollination. The hairy covering of the body and legs of the honeybees, and their brushes and combs for gathering and carrying the pollen, make their visits more efficient than those of other insects.

From some flowers the bees take only nectar; from others, only pollen; and some bees at times gather nectar alone, and others pollen alone; for bees make their pollen-collecting trips during the morning hours (Casteel).

The harmony of nature and the divine law is shown in these facts, that the tree-fruits bloom early, each in its own time and order, so that each gets its own pollen, and at a season when the honeybees are usually most of the flying insects present. They are numerous, active, and are insatiable and untiring gatherers of both nectar and pollen from the fruit blossoms. Then the rapidity and great increase in numbers of the bees is another favoring factor.

Chas. A. Green (Rochester, N. Y.), the well-known horticulturist, suggests that a single honeybee may visit 100,000 blossoms in gathering an ounce of honey; while D. C. Polhemus, a Colorado apiarist, says that a bee visits about 125,000 blossoms in making a *pound* of honey. If either estimate be true, and there are some 100,000 bees to every thrifty hive, surely effective cross-pollination could be secured with a hive to each two acres.

The use of bees in greenhouses, for fertilizing the bloom of vegetables grown for early markets, has been long a recognized necessity. The demand for bees for cross-fertilizing orchards is insistent. It should be a universal practice.

Colorado Springs, Col.

HOW TO PUT IN BOTTOM STARTERS

BY EMMA WILSON

Dr. C. C. Miller:—Several times I have tried to put bottom starters into sections, but could never make a success of it. With full-size foundation I have no difficulty. My Daisy foundation-fastener is of the old style, with a high rounded top coming above the section. To facilitate the removal I cut a deep groove into which I can insert a finger behind the foundation, and with the end of the finger support this, while I take the section away.

However, with the bottom starters it is different. The block (against which the foundation rests) always gets very warm, and covered with a waxy film to which the bottom starter adheres, so that,

when I remove the section, the starter either sticks to the block or drops over backward, and, in the latter case, if I try to raise it up it comes loose from the section. WM. MUTH-RASMUSSEN.

Independence, Cal., Jan. 20.

Dr. Miller has placed this in my hands for reply, saying that it is much more in my line than his.

Putting in bottom starters is so easy for me that it is almost done mechanically. Still, I can imagine conditions that would make it difficult. We use the same style of Daisy foundation-fastener that you do, and I can not see why you need to cut any groove or need any support from behind in putting in the large top starter.

Now as to that troublesome bottom starter. I wonder if the chief difficulty is not that you cut the starter too narrow. Even so good an authority as A B C and X Y Z of Bee Culture gives the depth $\frac{1}{4}$ or $\frac{3}{8}$ inch. We find $\frac{5}{8}$ inch the best depth. If the starter is too narrow it is much harder to fasten in, and the bees will be apt to gnaw it down. It seems to me a $\frac{1}{4}$ -inch starter would be very difficult to handle, and even an experienced workman would make very poor work with any thing so small. The bottom starter is always fastened in first.

If foundation must be put in during very warm weather, use the early morning hours for the work, and keep the foundation as cool as possible. Do not allow the wood of the section to become heated. If this happens, take a fresh section, and allow the heated one to cool. The quicker the work is done, the better; so, if possible, do not get nervous over it, as it will help a whole lot if you yourself can keep cool too.

I will now try to tell, as well as I can, just how it is done at Marengo. Take a section upside down with the right hand. Place it on the machine; then with the thumb of the left hand at the bottom of the section at the left end, and fingers of the same hand at the top, push the section and machine back so that the section will be under the plate, and at the same time pick up the bottom starter from the lap with the right hand. Put the starter in place against the block with the edge resting on the plate, keeping the tip of each fore finger pressing lightly on the top edge of each end of the starter. Then very quickly pull back so that the starter will slip off the hot plate, and hold in position not more than a second. If the work has been done quickly so that the wood of the section has not been heated, the foundation will cool in that time so as to hold firmly when the section is reversed to put in the top starter.

Marengo, Ill.

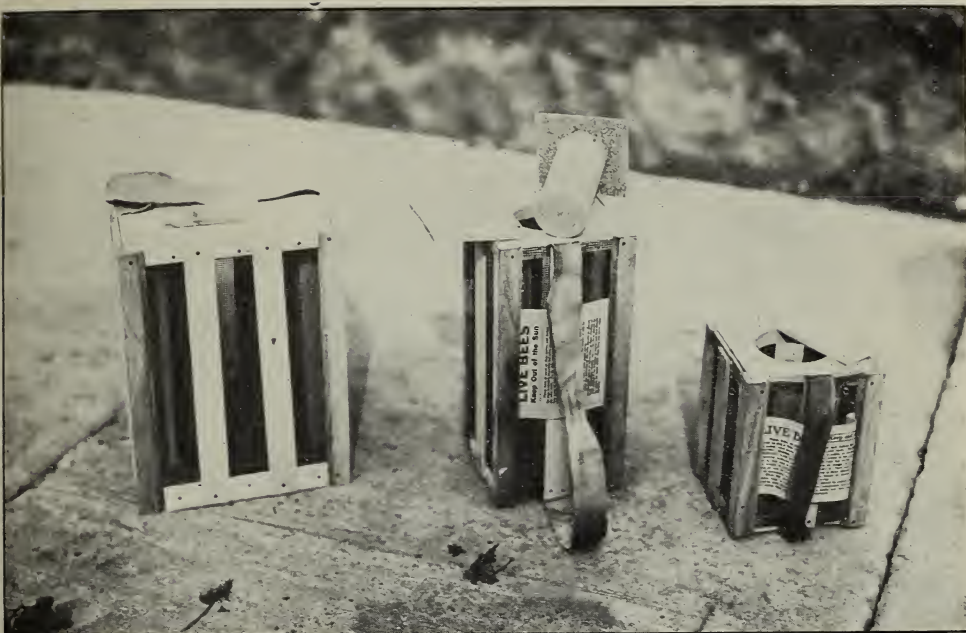


FIG. 1.—Old style of pound package for shipping bees without combs.

SHIPPING BEES IN POUND PACKAGES WITHOUT COMBS

New and Old style Cages; Construction of Cages, and How to Prepare Bees for Shipment

BY E. R. RCOT

There is no one subject, perhaps, that has been introduced during the last six or eight months that has called forth more correspondence than the one now before us; viz., how to ship bees without combs for the purpose of saving express charges, and eliminating the possibilities of transmitting disease.

For years we have sent bees in pound and half-pound packages; but it has been only within the past two years that we have attained any degree of success. Some fifteen or twenty years ago, when we shipped bees in this manner we lost fully fifty per cent during transit—so much so that we finally gave the business up in disgust. But two years ago it seemed to be more important than ever that we should devise some scheme by which we could send bees without combs, on account of the general prevalence of bee disease; for combs are the chief means for the transmission of infection from yard to yard and from one locality to another. Indeed, we may say that, were it not for the moving of hives of bees from one place to another, foul brood would be confined to a comparatively

narrow area. But it has been pretty definitely proven that bees shaken or brushed from combs may be placed in any clean hive or package without danger of carrying disease. In fact, the basic principle for the treatment of foul brood is the separation of the combs and honey from the bees having foul brood. The pound package calls for neither combs nor honey; and, what is more, a given portion of bees can be shipped without them at about one-fourth the expense for express charges that would be required were combs sent. But it may be argued here that the combs may contain brood, and that this brood will hatch into bees. On the other hand, we may say that all "unsealed" brood will be removed or starved. Unless bees have water given to them *en route* at frequent intervals they will not take care of their unsealed larvæ. But the shipment of brood in any form involves the danger of carrying disease; and the time may come when legislation will entirely bar out the traffic in bees with combs. In the mean time it behooves all shippers of bees on combs to take extra caution to see that their yards are clean, and, so far as possible, encourage the purchase of bees in combless packages, or what has been popularly termed "pound packages."

We said a little way back that, during the last year, we have been quite successful in shipping bees in pound packages, when

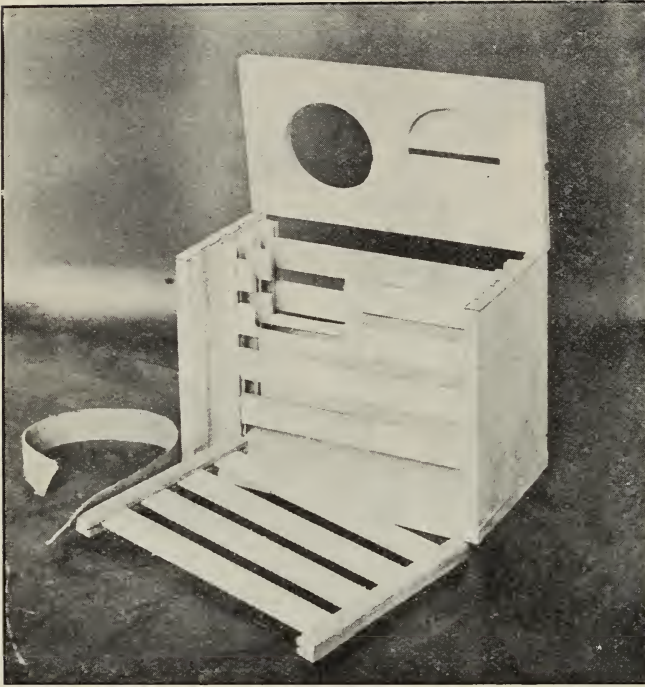


FIG. 2.—One-pound cage dissected, showing internal construction of new style.

our earlier experiments were any thing but satisfactory. The cause of our former failures we now know was due to two conditions—lack of water in hot weather and the absence of suitable supports in place of combs for the cluster.

Years ago shipment of bees in pound packages during hot weather was nearly always attended with loss, requiring at least fifty per cent of replacement. During the past summer we discovered that we could eliminate this loss almost entirely by giving the bees a bottle of water. In some cases

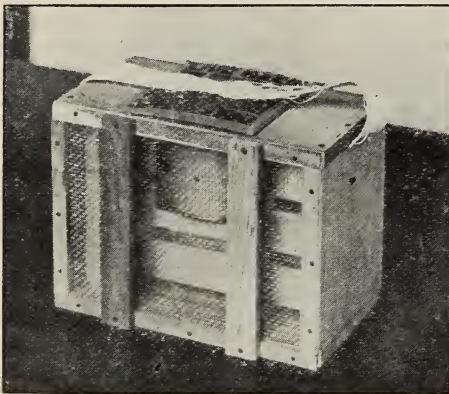


FIG. 3.—New style one-pound cage for shipping bees without combs.

there was a failure because the bottle did not feed the water fast enough. The most suitable container for the water seems to be an ordinary self-sealing tin can. The top of the can (or what will be the bottom), after filling with water, is perforated by a hole a little larger than one made by a good-sized pin. This bottle, after the case is filled with bees, is secured to a wooden cap that closes the hole in the top of the cage. See Fig. 1. The middle cage shows a tin can with a perforation in the bottom. Across the top is soldered a sheet of tin. This acts as a support for the bottle after it is inverted and set down in the hole in the cage. A wooden cap covers the hole. The style of tin bottle shown in Fig. 1 is not used now—that is to

say, we now employ a regular self-sealing can instead, the bottom of which is secured to a wooden cap that closes up the hole in the cage.

The other requirement we found necessary was some means of support for the bees while in transit. Years ago we dumped the bees into a wire-cloth box, when they would shortly form into a cluster like a little swarm, thus hanging on to each other for the whole trip. While bees can hang in the form of a swarm for a short time, experience has shown that it is more natural for them to hang on to something, and why not? Just notice how a swarm will show an inclination for a large bushy limb with little limbs projecting in all directions. With that idea in view we instructed one of our men to make up some cages with a series of wooden slats passing centrally through the cage. In Fig. 1 these slats are shown only indistinctly; but in the more modern cages (see Figs. 2, 3, 4, 5, 6) the slatwork consists of a series of fences—slats about $\frac{3}{4}$ inch wide, and spaced about half an inch apart. A series of these fences are slipped down into grooves in the ends of the cages. See Fig. 2. Two of the central fences are cut out to make room for the water-bottle, as will be seen.

In this connection it is proper to remark that the cages shown in Figs. 2, 3, 4, 5, 6

are much better and stronger than the old style shown in Fig 1; and, moreover, when the water-bottle is mounted in place, the strap handle will always keep the cage right side up and the water-bottle right side down so that it will always feed water. In the old-style cage the bottle would be on its side, and when half empty would not feed water, as will be seen by the middle cages in Fig. 1. The new-style cages with solid top, bottom, and ends braced with the transverse fences and the cross-cleats over the wire cloth on the two sides, make a very strong cage—one that might stand the rough handling of parcel post, providing bees could be shipped that way. The water-bottle in the cage of the half-pound and the five-pound size is stationed in the center of the cage. See Figs. 3 and 6. In the one and two pound sizes it is placed at one side. See Figs. 2, 4, 5.

In Figs. 4, 5, 6 will be noticed little cake-tins placed on top of the cage at one or both ends. These are filled with ordinary queen-cage candy made by mixing powdered sugar and honey that has been thoroughly sterilized, and then kneaded into a stiff dough. These cake-tins are filled level full of the candy, inverted, and nailed over a longitudinal slit in the top. See Fig. 2. The larger-sized cages require, of course, more candy and larger containers, and all of them require water in hot weather.

HOW TO PUT BEES INTO THE CAGES.

There has been a raft of inquiries as to *how* we get the bees into these pound cages. This is a very simple matter. Just suppose we are going to put up a two-pound package of bees. We take a package of suitable size, put it on a pair of scales having an adjustable dial to take off the tare. Then we set the pointer back to zero. We now open a hive which the records show is capable of filling this order, and yet leave sufficient bees to take care of the brood. We next find the frame the queen is on, and

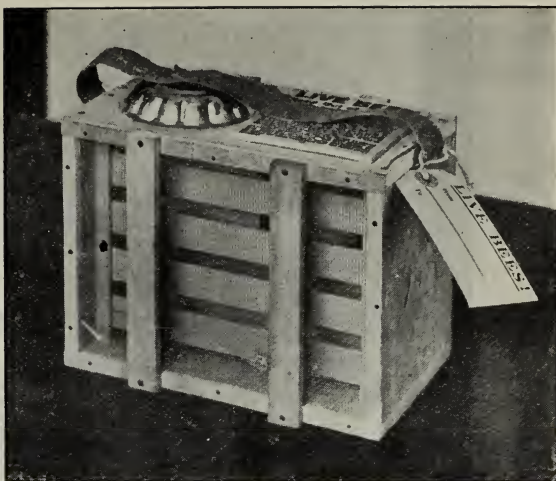


FIG. 4.—Two-pound size, new style, without combs.

set it down beside the hive. We now take a position as shown in Fig. 7, with a specially constructed funnel having a large oblong top and a small contracted opening at the bottom just large enough to insert in one of the round holes in the top of the cage. The frame is inserted in the funnel as shown, and given one quick shake, dislodging four-fifths of the bees. As the inside of the funnel is smooth, the bees slide right down easily into the cage. Another frame is shaken in like manner; and when the pointer on the scales registers two pounds, exclusive of the tare taken off, the

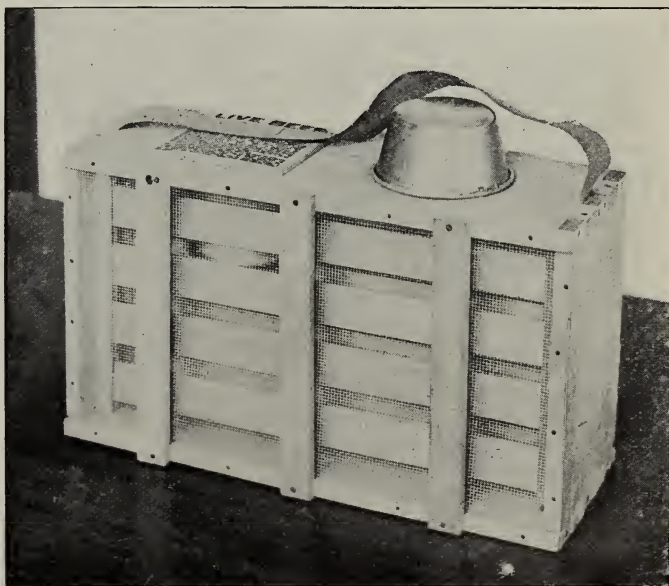


FIG. 5.—Three-pound size, new style, without combs.

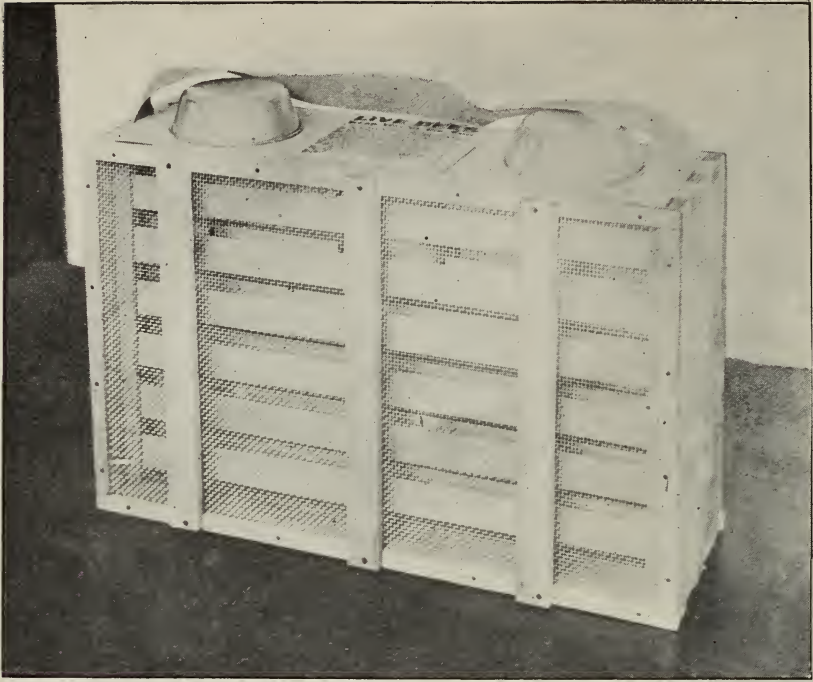


FIG. 6.—Five-pound size.

funnel is removed. If bees are gathering honey freely we add 25 per cent to their weight so as to give full measure. After the bees are all shaken into the cage, the last operation is to pick the queen off the comb that has been set aside, and gently drop her among her subjects in the cage. But it very often happens in the early part of the season that it is better to fill an order from four or five different hives. To take two, three, or even only one pound of bees from a colony in the spring is a severe drain on them. Sometimes we fill a package from three or four different hives. That, of course, means we will have in the cage as many different lots of bees.

How about the queen? In nine cases out of ten any queen from any hive may be dropped into such a heterogeneous mass of bees, and be accepted without any further trouble; but because of that one failure out of ten we now make it a rule to use a virgin-introducing cage with a plug of candy in it, and into this we put the queen. The introducing-cage is secured to the wooden cap that covers the filling hole. In four or five hours the bees will be ready to accept their queen—that is to say, they eat out the candy and release her.

So far we have been able to ship bees during the hottest weather in summer, providing we use water-bottles properly arranged

so that they will feed water during the entire trip. We have already published reports of how we have shipped bees successfully to Oregon, Florida, Maine, and many other points, with the loss of scarcely a bee.* But it is exceedingly important that the candy be made just right. A candy that is too soft will run down and daub the bees. A candy that is too hard the bees can not eat. It must be just right. We make up a batch of candy about a month before we expect to use it. We let it stand in a warm room; and if it begins to spread in the pan or on the molding-board, after standing two weeks in warm weather, more powdered sugar is kneaded in. If, after a week or ten days, it seems to be soft and moist so that it can be indented by a pressure of the finger, and yet will hold its position without "running" on the molding-board, it is then fit to use. A word about the sugar. Be sure to get powdered sugar without starch in it.

We anticipate that the pound packages of bees we illustrate, or those embodying these principles, will be a nice business for

* We shipped one three-pound package of bees to Guelph, Canada, last winter, when the temperature was nearly down to zero. About one-third were dead on arrival. The expressman probably felt sorry for them, and set them against a steam-radiator. We don't believe the cold killed the one-third that were dead.



FIG. 7.—Method of putting bees in the cages.

beekeepers all over the country. It will make an interchange of bees possible from one locality to another without danger of transmitting disease, and at the same time reduce the cost of express charges down to a mere trifle. It will also make it possible for the extensive beekeeper to ship a thousand colonies in a carload from the South to the North as against only 250 colonies on combs in hives. But do not let any one be foolish enough to try to ship a carload of bees in pound packages until the thing has been tried out more thoroughly in small express shipments. We expect to send fifteen or twenty colonies to Des Moines in three and five pound packages, as shown in Fig. 6. The express on these will be about one-fourth what it would be on full colonies. The bees will be shaken on frames of foundation toward night. The entrances will be closed with perforated zinc. Now right here is a danger. Where possible, bees in pound packages should be let loose on a frame of unsealed brood. Where one already has bees in the yard, he can secure his brood from other colonies; but in the case of a beginner who has absolutely no

bees, he will have to let them loose on foundation, and watch them carefully next day, as they may swarm out. Of course, bees that are let loose on foundation should be fed a thin syrup.

Another question here has been often asked—"How are you going to get the bees out of the cage on the frames?" Smoke the bees a trifle, and pry off the cleats on the side; remove the wire cloth, and lay the cage flatwise down on the frames. Put on an extra super, then the cover. In two hours the bees will come down on to the combs. If the bees have a frame of honey, or, better, one of unsealed brood, they will go down immediately. If only bare foundation, they will show a tendency to cling to their cage several hours, when they will gradually work downward.

Now one more caution. Do not try to ship bees by parcel post. It is forbidden by the regulations, and under present conditions it will not be possible to get the bees through alive in the ordinary parcel-post mail-bags. So do not try it under any conditions.

These special cages may be obtained of the dealers. But better not try to make up your own cages, as your first experiment may be a light fragile affair that will not stand ordinary usage in the express car.

We have so far omitted to say that, along with every package, is a live-bee tag with instructions to the express man to keep the bees out of the sun, away from steam-pipes, and from exposure to unnecessary cold.

BEEKEEPING IN SOUTH RUSSIA

BY AUGUST DE MALACHOWSKI

I am sending you some photos* of my hives in Russia, and a drawing of one of my "Elita" hives, as well as my Eureka feed-trough. I shall not dwell long on the description of my hives, because the drawing shows the same sufficiently. There only remains for me to say that the hives are constructed of spruce, one inch thick. These hives have been giving me complete satisfaction for some years; and even this year, which was very bad for honey-making, and during which the bees did not make cells in the Dadant-Blatt hives, my Elita were full of honey, and I obtained more than 55 lbs. of honey.

My frames are also another peculiarity. The interior size of the brood-frame is $8\frac{1}{2}$ inches wide by 17 high; and for the super,

* One of the photographs sent is used as our cover picture for this issue.—ED.

8½ x 8½ inches. I arrange so as to put into the large frame two smaller ones that fit into the super. Once my frame is divided in two, I can at any moment remove the contents of the frames or transport to the super a part of the honey, put the brood-combs below, etc. I make these interior frames in the sectional style, of boards about ¼ inch thick.

I have many of these frames ready with wax foundation, and I use them even with my Elita hives, or with my brick hives when needed. This is extremely practical in apiculture, because, having these frames in the super filled with honey, after making a springtime visit and noting that the bees are short of honey, nothing is easier than to give them one of these surplus combs of honey.

The engravings show that I have some brick hives. There are four colonies in each house. Each colony has a wooden hive covered on two sides with moss or fine straw, and entirely covered by some boards in order that the mice may not enter. These hives are very practical, because the bees winter in them very well on account of the even temperature.

All my hives without exception, even the Dadant-Blatt, are furnished with my Eureka feed-troughs, which have given me entire satisfaction, and are so practical that one can feed the colonies at any time without opening the hives. I fill a bottle, equip-



Latest model of Malachowski's hive, "Elita," with "Eureka" feeder.

ped with a small aluminum tube, with syrup or diluted honey. If it is cold weather I heat it a little; and when I turn the bottle upside down in the trough I can then see in a few moments that the bees are quickly eating the honey by the bubbles of air which come up. This is very practical, especially in the spring time, in order to stimulate brood-rearing. I can feed an apiary with 100 hives in half an hour at the most.

I make my feeders in the house; and, moreover, if the hive is thick or has double walls I only lengthen the tube. As there are only two small openings to allow the syrup to pass through, the bees can not enter into the tube.

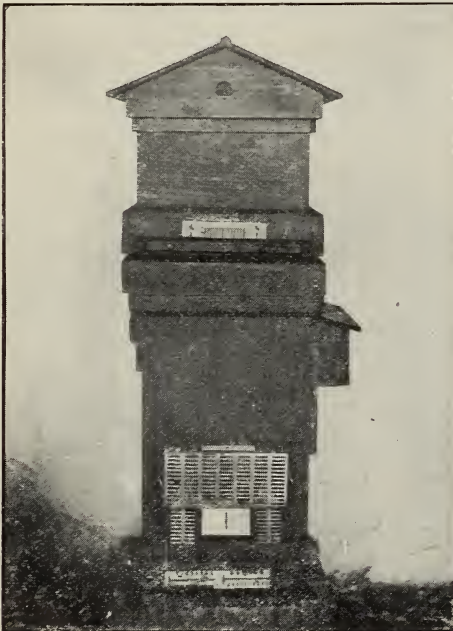
This is the feeder that I recommend, especially to my co-workers in apiculture in America; and by using the same you will find that you will be very well satisfied.

Odessa, Russia.

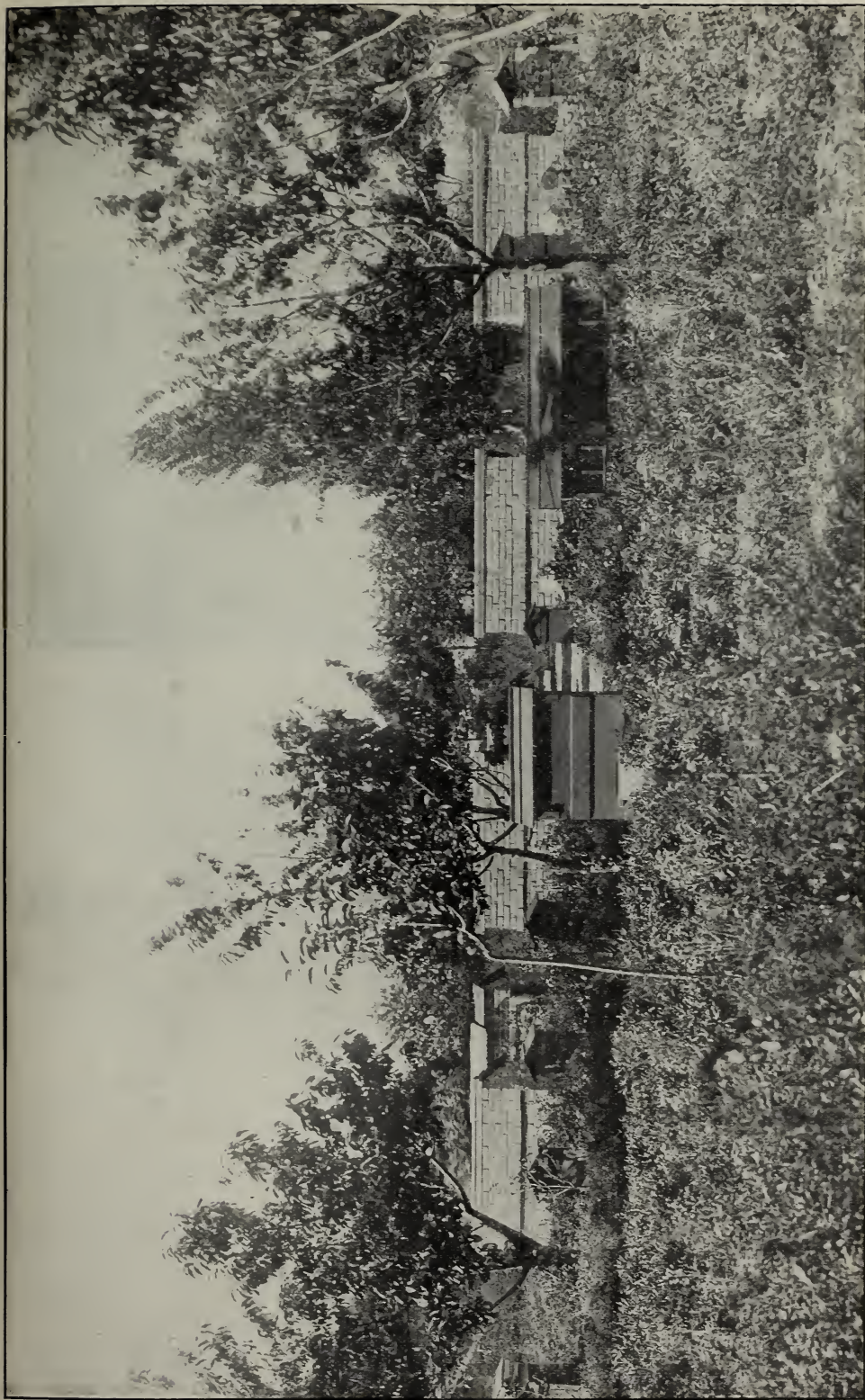
BEES AND THE PARCEL POST

BY R. W. COBB

In GLEANINGS for January 15 and February 15 the possibilities of shipping bees by parcel post in one-pound packages or cages is commented upon by the editor. It is a very interesting subject to me, as my occupation for the past ten years has been



The old type of hive equipped with box feeder.



Portion of apiary of A. de Malachowski, in South Russia. In every brick tenement hive there are four colonies.



One of the first models of Malachowski's hive, "Elita."

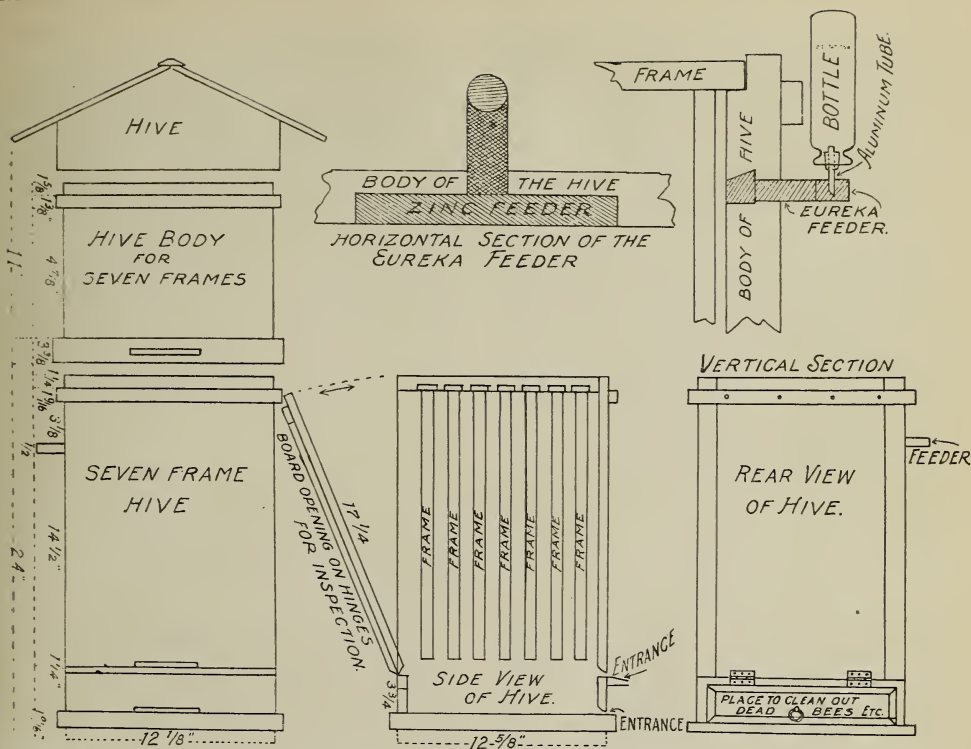
that of a railway postal clerk. I have given this much thought ever since The A. I. Root Co. shipped the two carloads of bees from Florida last spring. Excellent time for freight service was made; but had there been a method for shipping by parcel post the expense would have been cut tremendously, and the time on the road materially lessened. I have always been in favor of the parcel-post system, and am more so since its inception; but having seen so much of the practical side of shipping packages of all descriptions by mail, it must be admitted that we beekeepers, with our present equipment, are far from being prepared to reap any advantages in this line from parcel post.

Before any attempt is made to ship a nucleus or even a half-pound or a one-pound package of bees by mail, provision should be made for a receptacle to combine four qualities. First, strength; second, ventilation; third, protection to the bees; fourth, protection to those who handle it. This means we can not use an ordinary wire cage, such as the express companies are now accepting. Neither can we use a package such as Mr. J. A. Kreighbaum describes, p. 132, Feb. 15. While he has partly solved the ventilation problem by providing the air-space between the two

walls, he has neglected to protect both ends and both sides. I infer from his description that a board was placed over the top, and a piece of heavy felt on the bottom; but no protection is afforded either end or either side against the possibility of a hole being made through the two walls of wire cloth. There is his weak point. While ninety-nine cages like that will travel safely by mail, the one hundredth one will meet with an accident and cause untold trouble.

But few people realize the great number of times a piece of mail is handled from the time of mailing until reaching destination, and the strain necessarily imposed upon it. In the case of bees, each handling means an additional jar and a consequent ruffling of their tempers, and the liability of the postal employee being stung.

The postal laws and regulations require all mail to be dispatched from postoffices to trains and *vice versa* in mail-sacks which are closed tightly to guard against any loss of mail. Hence the instant a parcel is dropped into a mail-sack its identity is lost until the sack is reopened. During this time the package of bees will be in various positions in the same sack. For instance, at one time it may be right side up; again, it may be on its side, and still later it may



be upside down. With the express companies it would not be out of sight at any time, but in the same position *all* the time. The above-mentioned conditions will hold, no matter how many caution or fragile notices the packages may be endorsed with. I can now bring out my point by a single illustration, somewhat lengthy, but showing practically the exact number of times a package would be handled in transit.

We will assume that The A. I. Root Co. at Medina, Ohio, mailed a package of bees to go by parcel post to Mr. Doolittle, at Borodino, N. Y. The postmaster at Medina places the bees in a sack with other second, third, and fourth class matter, and dispatches it by wagon to a railroad depot at Medina. It is then taken from the wagon at the depot and placed on a truck, and wheeled across the station platform and put on the train, where the postal clerk opens it and makes proper separation of the mail. The bees are then placed in a sack which is labeled "New York," along with all other mail for that State.

At Cleveland the sack is taken off this train and placed on a truck with many others, and wheeled across the station platform to a wagon awaiting the arrival of this train. It is then placed in the wagon and transferred across the city to the depot of

the L. S. & M. S. railroad. Here the contents of the wagon are sorted, and each individual sack placed on a truck with other sacks for the same State, and then wheeled to the car of the train into which they are loaded. As the sacks are taken into the car by the men, they are placed in a pile until each individual sack can be sorted. That is, all the sacks labeled "N. Y. State" are placed in one pile, and those labeled "Massachusetts" in another pile, and so on. In the New York pile there may be anywhere from ten to forty sacks full of mail. The sack containing the bees may be on the top, in the middle, or perhaps at the bottom of the pile. The next procedure is, distributing these sacks—that is, dispatching each individual piece of mail to its proper destination. This time the sack containing the bees is carried from the pile in which it was placed when taken aboard the train, and contents dumped on a table, so as to be readily accessible to the postal clerk, who places the bees in a sack labeled "Syracuse & Rochester R. P. O." (railway postoffice). Before arrival at Syracuse the sack is taken out of the rack in which it was suspended, and placed in a pile of mail to be put off at that point. It is then loaded on to another truck and wheeled across the depot platform to the "Syracuse and Rochester"

train, where it is taken into the car and goes through the same process of being piled in with several other sacks which are to be distributed on this train. Here the bees are placed in a sack of mail for Borodino, and eventually put off at that place and carted to the postoffice, where the sack is opened, and bees delivered to Mr. Doolittle.

During this time the bees have been on their journey less than fifteen hours, and have been handled a great many times; yet only three persons knew the contents of the mail-sacks. Mr. Kreighbaum's receptacle practically requires that every person handling a sack of mail know its contents—a condition which is impossible.

I think from the foregoing that any one can understand why the receptacle should be firm, strong, and well built. The strain which has been imposed upon it has been enormous. Should it be unfortunate enough to have had an extra-heavy weight placed upon it, causing some portion to spring, or a hole have been made, allowing the bees their freedom, a great many stings would be received by those handling it. Should any of the government employees be stung, a ruling would soon emanate from the Postoffice Department at Washington, barring bees from the mails entirely. This would place us in the same predicament we were in about thirty years ago. It is not hard to imagine how serious an injury to apiculture this would be. I have reread the article in *GLEANINGS* of March, 1880, page 106, and must say that the conditions are just the same to-day regarding the essential qualities of a mailing-cage.

We must bear in mind that it is now allowable to ship such things as iron and steel castings, not exceeding ten pounds in weight, by parcel post. For my own part I would not care to meet an infuriated bunch of bees which had just made the acquaintance of an iron casting, killing and maiming a portion of them. Consider, then, the predicament of the postal employee who has never seen nor heard of a veil or smoker. I well remember the day when, still a small boy, I was returning home on the train with my father and mother after a day spent at The A. I. Root Co., in Medina. Father had purchased a pound package of bees which we were carrying home, and, boylike, attracted by the bees crawling on the screen, I undertook to feel of them, which resulted in my receiving a painful sting. My cries furnished entertainment for the occupants of the entire car.

As the postal laws and regulations now stand, I do not think a package of bees of

any size other than these in which we have sent queens is mailable. Section 496, paragraph 7, of the Postal Laws and Regulations, plainly states that "Queen-bees and their attendant bees" are admissible to the mails. A pound or a half-pound package would not enter into the spirit of this law. I might add that queen-bees and their attendant bees and the Australian ladybird are the only live "stock" admissible to the mails. I can hear some people saying, "Oh! we have received such and such a live thing by mail." That is true, and the explanation is easy. The postmaster at the office of mailing was ignorant of the Postal Laws and Regulations or it would have been withdrawn from the mail and returned to the sender.

By all means, before we jeopardize the privilege we now have of mailing queens, let us perfect a suitable receptacle for shipping bees, and then have it approved by the postal officials at Washington.

Lakewood, Ohio.

[The present regulations with regard to packages by parcel post are such that it would be impossible to ship bees in that manner, and get them through alive, even though the postal regulations did permit it. If they are ever to be sent by parcel post it would never do to put them in a mail-sack as we do the queen-bees and their attendants. They would smother to death. A large number of bees, say half a pound, a pound, two pounds, three pounds, or even five pounds, would need to have a large amount of air; and during hot weather they would smother to death in a very few minutes in an ordinary closed mail-sack. If the time ever comes when we can send pounds of bees by mail there will have to be some regulation that will permit packages of bees to be left outside of the mail-sacks. Whether Uncle Sam will ever make such discrimination in favor of bees is doubtful. If the time ever comes when it is permissible to send live poultry by parcel post, then we might be able to secure a ruling that would permit live bees in quantities of half a pound, pound, two pounds, or three pounds, to go in that manner.—ED.]

Treatment of Laying Worker Colony

P. C. Chadwick, referring to page 75, Feb. 1, will there not be bloodshed in the laying-worker colony, now containing the frame of brood, on the return of the *flying bees* of the strong colony, on whose stand the former colony is now placed? I presume you also mean that the queen of the colony which is now placed on the stand of the laying-worker colony has to be caged for a time to prevent molestation from the bees of the latter.

JOHN ELIAS JAMES.

Pontardulais, Orange, South Africa.

IS ALFALFA POLLINATED BY BEES?

Some Interesting Points in the Discussion

The following article appeared originally in the *Dakota Farmer*, on page 61, by A. O. Stevens, of the North Dakota Agricultural College. One of our subscribers, Mr. Jess Dalton, questions the correctness of Mr. Stevens' statements, and desires to make a reply. In order that the reader may better understand it, we are publishing this article entire.—Ed.

BEES AND THE ALFALFA SEED CROP.

In the December 15th issue of *The Dakota Farmer* appeared an article referring to the value of the honeybee as a pollinator of the alfalfa flowers. The article in question is quoted for the most part from *The Country Gentleman*, and begins thus:

"Very few data are at hand relative to the value of insects in the production of a seed crop." This is quite true; but it is also true that most of the discussions on the subject appear to have been written without a knowledge of the data which are available. Nearly half a century ago it was made known by men of no less authority than Mueller and Henslow that the bee visits the alfalfa flowers without effecting pollination.

Far be it from the writer to discourage the bee industry, especially in connection with such a valuable honey-plant; but the subject has been treated so frequently without due regard to the facts that it seems desirable to present a brief survey of the situation.

In order to understand the conditions it will be necessary to call attention to the flower structure. The stamens and pistil of each flower are enclosed by the two inner petals (which are united along the lower edge, and are known as the "keel"). The pollen-bearing portions are thus entirely concealed, and are not exposed to visiting insects. When, however, a pressure is applied inward and downward upon the keel petals, a certain tension is released, which causes the stamens to snap upward with considerable force. This may be readily observed by using a toothpick or other pointed object. If this pressure is applied by a bee, the pistil (which is enclosed by the united filaments of the stamens) is thrust against the insect's body, and pollen is rubbed upon the insect by the stamens. As the pistil projects slightly beyond the stamens, it is likely to receive first the pollen left by a flower previously visited.

The bee, however, rarely inserts its tongue at this part of the flower, but thrusts it between the two outer petals, leaving the stamens undisturbed. The bees are easily observed, and any one may satisfy himself on this point. In one trial by the writer at Manhattan, Kansas, in 1909, the visits made to 584 flowers were observed in about an hour. Of these, only nine were tripped by the bees.

Concerning the effectiveness of other insects, practically no data of value are available so far as is known to the writer. The insects usually mentioned are butterflies, bumblebees, and "wild bees." The butterflies are common visitors, but seem to be of very little if any value. Bumblebees, according to a few observations made the past summer, often reach the nectar in the same way as the honeybees, although they seem to trip the flower more frequently.

The wild bees are practically unknown except to those who have given them special study. Every locality with an average number of native plants has one or two hundred different species of these bees, so that the expression, "where insect life is scarce," is hardly applicable to many cases. By no means all of these are adapted to such a flower as that of alfalfa. In the limited observations which the writer has been able to make, the only bees which tripped the flowers regularly were the leaf-cutters (*Megachile*). These and their near relatives

may be distinguished by the fact that the females collect pollen on the under side of the abdomen. The species chiefly observed is nearly as large as the honeybee, and with a tongue of nearly equal length. Another common one is about one-half larger than the honeybee, and with a longer tongue. On the whole these bees seem better adapted than nearly all the others to this plant. The species are very numerous, and are found over nearly all the world.

Now that the probability of insect pollination has been reviewed, the necessity of it needs a little attention. To quote again the previous article: "At the Kansas Experiment Station, alfalfa plants covered with a wire netting * * made no seed, whereas those plants that were adjacent but uncovered were filled with seed-pods." This reference seems to be to bulletin No. 155 where some such statement is made, but without details or data. Another bulletin of the same station (No. 151) presents unmistakable evidence to the contrary. A careful study of the data presented seems to indicate that, while insects may be important, there are some unknown factors, physiological or otherwise, of greater consequence. All of the plants covered with wire cages, and left undisturbed, produced seed, but at greatly varying rates; those having but little, also being light producers in the open field. If a calculation be made from the plant producing the most, a ton of green plants would yield 8½ pounds of seed. On the same basis for five plants which were divided, half of each plant being covered and hand-pollinated, the other half permitted to be insect-pollinated, the average would be 10.4 pounds for the hand-pollinated, and 11.8 pounds for the insect-pollinated. Again, from twenty-six plants, hand-pollinated, the average would be 5.8 pounds, and the highest 68 pounds, per ton of fresh plants. There was also a great variation in the per cent of flowers producing seed, and this did not correspond to the amount of seed per weight of plant.

Burkill, who investigated the subject quite carefully in England, did not secure seed from untripped flowers unless he pinched or rubbed the tip of the pistil. He seems to have inferred that the striking of the pistil against the insect's body was an essential point. It is well known that injuries to plants often induce fruitfulness, and perhaps the dragging of an alfalfa-field may act in this way in addition to tripping the flowers.

This was submitted to Mr. J. H. Lovell, of Waldoboro, Maine, whom we regard as the best authority on the pollination of plants by insects, perhaps, in the United States. He has done a vast amount of field work in investigating the subject of pollination. He is an entomologist, a botanist, and at the same time a beekeeper. We have submitted this to him for his examination, asking that he give us his views for publication. At the same time, we suggested that, when a plant has nectar, color, and odor, it has these properties for a purpose—to invite the visitation of insects—bees in particular. Mr. Lovell's reply is interesting and valuable, and we think it shows conclusively that bees, so far from being of little or no value in pollinating the blossoms of alfalfa, are a very important factor in increasing the seed crop. We will now let Mr. Lovell speak for himself:

Dear Mr. Root:—Your favor of the 13th instant is at hand, with enclosures as stated.

I am sending a brief account of about all that is known in regard to the pollination of alfalfa up to the present time. Last summer I cultivated a bed of this valuable fodder plant in my garden for the purpose of studying the relation of the flowers to insects; but, unfortunately, the season was very wet, the leaves rusted badly, and few flowers were produced.

It is well established by numerous observations that honeybees do not usually pollinate the flowers of alfalfa, but obtain the nectar through a hole in the side of the flower. That is, there is an imperfection in the structure of the flowers which the keen observation of the honeybee quickly discovers. It can extract the nectar more easily through this crevice than in the normal way. So far as beekeepers are concerned this is an advantage, since a bee requires less time to gather its load of nectar.

The flowers are often pollinated by bumblebees, though they, too, sometimes pilfer the nectar; by butterflies and by leaf-cutting and mason bees. The two last-named genera, which are provided with a pollen-brush on the under side of the abdomen, are better adapted for this purpose than the honeybee. There are many species of the leaf-cutting bees (*Megachile*), and in certain localities they are so abundant as to defoliate trees. So far more than 24 species of wild bees have been observed on the flowers, besides many butterflies, flies, and beetles. Just how many are efficient pollinators is not known. Many are not. In South America the flowers of alfalfa are often visited by small birds resembling hummingbirds, called honey-suckers.

A single normal visit is sufficient to effect pollination, and all further visits are useless. The flowers are known as explosive flowers. The anthers and stigma are held in the keel under tension. When a bee presses down the wings and keel it pulls, says Burkill, two triggers and fires off the flower—that is, the anthers and stigma fly forcibly upward and out of the keel, and the pollen is thrown against the body of the bee—a kind of catapult. The stigma is a little in advance of the anthers, and strikes the pollen-brush of the insect first. Both of these organs then move upward against the standard, where they are out of the way and do not again come in contact with insects.

The flower should now cease secreting nectar, since nothing is gained by the attraction of further visits from insects; but here we meet with another imperfection, for the secretion continues. Insects, therefore, continue to visit the exploded flowers,

when it would be of much greater advantage to the plant species for them to visit exclusively flowers not yet pollinated.

The flowers can not be pollinated by the wind; and, according to Urban and Burkill, they do not possess the power of self-fertilization, even when the stigma is surrounded by pollen. According to the latter observer, the stigma does not become receptive in the absence of insects until it has been rubbed or scratched by a brush or a needle. The reason for this is, I believe, largely mechanical rather than physiological. The stigma is covered with papillæ, which may sometimes prevent the pollen grains coming sufficiently near to receive the stimulus necessary to excite germination. But when they are rubbed between the papillæ by the pollen-brush on the bee, germination promptly follows. A slight change in the conditions, which probably often occurs, as greater sensitiveness on the part of the stigma, or greater pressure, would induce self-pollination. Henslow records that plants he protected yielded more seed than those left unprotected. In cold wet weather the flowers wither without exploding. Where the vines are cut before they bloom, as is the increasing practice in the West, it is, of course, of no consequence whether the flowers are pollinated or not. When alfalfa is cultivated for its seed, there is, so far as I know, no complaint that the flowers are sterile.

Mr. Stevens says that he saw 584 visits made by "bees" (not by one bee) in about an hour, and that in nine instances the flowers were exploded or "tripped." It is probable that many of these flowers were already exploded. This observation is of considerable interest in showing that the honeybee is of real importance in the pollination of alfalfa; and it is to be regretted that he did not give the matter more attention, for Mueller never once saw honeybees visit the flowers legitimately. A man could hardly watch closely for an hour more than five square feet; and if in this area there were nine cases of pollination, then at the same rate there would be about 8000 on an acre of alfalfa, or in ten hours 80,000 flowers pollinated. It is to be remembered that only one visit is required, and that subsequent visits are valueless. Of course, such an estimate based on a single observation is to be taken with great latitude; but it indicates that the honeybee is of more significance in the pollination of this species than has been commonly supposed.

Even if the flowers of alfalfa can not fertilize themselves in Europe it does not follow that this is true in western North America. There are well-known instances

of flowers which, in one climate are infertile, becoming fertile in another. It has, moreover, been asserted that in Germany the flowers have the power of self-fertilization. In experiments made at the Kansas Experiment Station, according to Mr. Stevens, plants covered with wire cages produced seed, though at greatly varying rates. But this difference seems to have been due to the character of the plants. There seems, then, good reason to believe that in America, at least in the western States, the flowers can produce seed, even in the absence of insects.

Mr. Stevens' article is in the main correct so far as it goes, but he seems not to be familiar with the mechanism of pollination, nor, as he admits, with the wild bees. The suggestion that there are some unknown factors which are more important than insects or self-pollination, if he refers to any thing more than weather or climate, is purely imaginary, and is an unnecessary supposition. The fact that the bees made so many visits in an hour would indicate that the flowers contained little or no nectar. It would require only a few seconds for a bee to thrust its tongue into the side of a flower, remove it, and pass to another flower. It would be an easy matter to count ten visits per minute, which would give 600 for an hour.

You are entirely correct in supposing that the possession of nectar, color, and odor are invitations given by flowers to insects; but the conditions may be modified when the flower is *not* cultivated in its natural habitat by the characteristics of the insects, etc. JOHN H. LOVELL.

Waldoboro, Maine.

NATURAL WINDBREAKS THE BEST; BUT THEY CAN NOT ALWAYS BE SECURED

BY R. F. HOLTERMANN

On page 181, March 15, it appears to me that Mr. Byer assumes that I said something which I have no intention of claiming. I have not compared the value of fences and natural shelter. There is no comparison, in my estimation. Natural shelter is desirable—very much so—and I aim to have it wherever I can; but, after all, the cases where sufficient natural shelter can be secured are rare. A great many people have to keep bees in certain positions from necessity, not wish, if they keep them at all; and the majority of these are *not* sufficiently sheltered. There are few locations wherein bees are now kept, and where we have a solid winter, to which I would not add a

fence as before described. A great many may not agree with me about this matter; but I have tested it sufficiently for my own satisfaction.

Our bees have wintered well; but some, I find, have starved owing to the open winter and resultant activity. To date, the least loss in an apiary is none (is that an Irish bull?), and the greatest, ten; the latter mostly starved. This latter was in the most exposed location, so far as natural protection is concerned, but it has a fence about it. Would the loss have been less if the fence had been down? I want *both* natural and fence protection.

QUEENLESS COLONIES GATHERING POLLEN, AND STORING IT IN CELLS FORMERLY OCCUPIED BY BROOD.

R. O. Martin, p. 180, Mar. 15, takes little stock in my argument as to queenless colonies gathering pollen because of the amount of pollen I find in the comb. Let me say again that my own eyesight, seeing the bees bring in pollen, is sufficient; but, more, the pollen stored in the combs is sufficient also. When I find pollen not in the cells about the comb, which is the natural position of brood, but all through the comb, not individual cells, but many, I am forced to the conclusion that the bees gathered it after the brood hatched from the comb. More, the distinction in this respect is so clear that I have pointed it out time and again (having the combs side by side) to young men learning the business. It is more than likely that, when I get among the bees, I shall find such combs; and if I do I will try to have a photograph taken of them, and send them to GLEANINGS.

If the bees can gather pollen after they are queenless and the brood hatched, then they place pollen in sufficient quantities where brood would otherwise be, it clearly indicates that this pollen was gathered after the colony was queenless; and the appearance of these combs is a direct contrast to colonies in the same apiary not queenless. In a locality scarce of pollen, these indications may not be so marked; but that has nothing to do with the question as to whether queenless colonies gather or do not gather pollen.

Brantford, Canada.

A Correction

In your editorial, p. 105, Feb. 15, you say, "while timothy hay, the kind referred to." By referring to my communication you will notice the kind of hay used by me was not mentioned, but *clover* hay, not *timothy*, was always used, as it is more springy or resilient—at least this is my experience.

Victoria, B. C.

E. E. ROBINSON.

Heads of Grain from Different Fields

The Robber-cloth Perfected

No doubt all users of the present robber-cloth have realized its lack of effectiveness in fully covering the open hive top at all stages of operations. I am pleased to present herewith for the benefit of other beekeepers, my original idea of a perfected robber-cloth as an aid to advanced bee culture.

By joining two cloths by means of a light stiff frame so proportioned as to leave a space of about $2\frac{3}{4}$ inches between the cloths, several new advantages are gained, and the duplex arrangement becomes positively effective in guarding the open hive top while convenient access to the frames is actually facilitated.

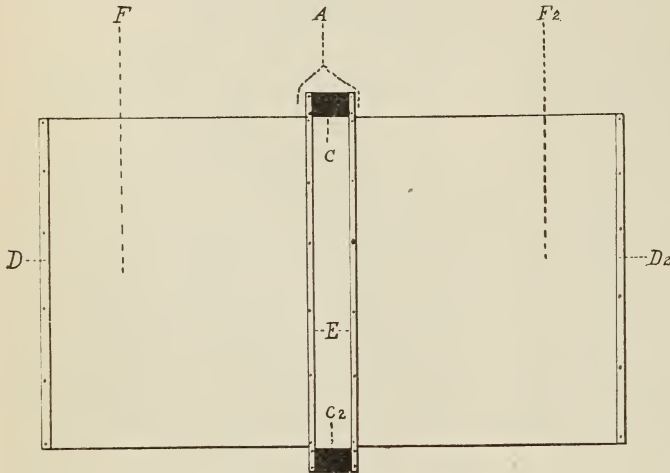


Fig. 1.

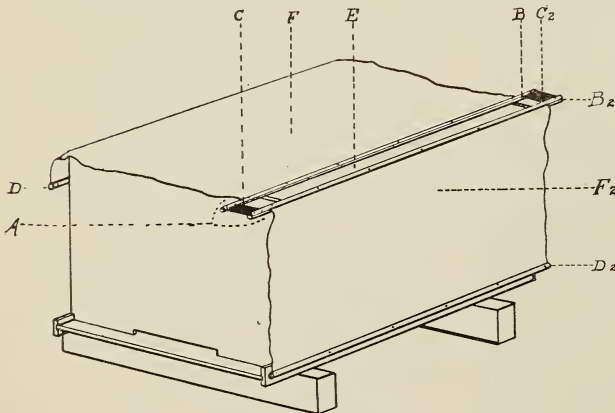


Fig. 2.

The drawings show the device so clearly that no description is really needed. In practical use the frame A is placed above the particular frame to be lifted, with each cloth lying flat away from the frame A. When it is desired to close the gap E, the frame A is grasped at either end by the finger and thumb,

and turned over, using either side as the axis. This movement draws the edge of one cloth over the other, thereby overlapping and closing the gap E. The reverse movement of the frame A again opens the gap almost instantly.

The edge of each cloth opposite the frame A is weighted somewhat by a hard-wood stick, an iron rod, or in any suitable way, so as to hold the cloth flat against the wind when the frame is turned. This frame A is best made from $\frac{1}{2}$ -inch dowels and two pieces of galvanized sheet iron. Three $\frac{1}{8}$ -in. holes are punched in each end of the iron pieces, through which to drive the clinching nails. The dowels are slit with a saw (a fine circular saw does it best),

but do not cut the pieces entirely apart until later. The reason will be evident when the job is further under way. Use flat-head thin wire nails just long enough to prick through. Place the selvage of the cloth next to the gap E, and hem all exposed raw edges. Proportion the cloths so that each will be an effectual cover by itself, large enough so that careful adjustment will not be necessary. An eight-frame cloth could not be used on a ten-frame hive.

This perfected robber-cloth is particularly useful in treating foul brood; but care must be taken afterward to sterilize it thoroughly before using again around healthy colonies. Two perfected robber-cloths are needed in practice, one for the hive being operated, and another for the hive to or from which frames are being taken. The perfection of this duplex arrangement is best appreciated under practical use. Any one is at liberty to make and use this new robber cloth, and it is my hope that it will be tried extensively, and that my expectations for it may prove well founded.

C. D. CHENEY.

Lyndhurst, N. J.

Spaces with Packing Material vs. Dead-air Spaces

It is generally conceded by carpenters that a dead-air space is warmer than a solid wall. I have no reason to doubt that it is; but I want the proof. I think it is proved that, with brick, stone, and concrete blocks, a dead-air space is warmer in winter than a solid wall; but that is *real* dead air. I mean that there is no air that can get through the cement blocks from the outside as I am sure it does through wood. A thermos bottle has the air pumped out, and contains only a vacuum, if I understand correctly. The same bottle with *dead* air would not be as good by a half—that is, to exclude either heat or cold for a long time. The thickness must be considered. A brick, stone, or cement wall with a dead-air space would be all the way from six inches to two feet

thick; but we can hardly compare the above-mentioned material with wood, straw, cork, and chaff. What I want to get at is a double-walled hive not too large, yet large enough to give the best of protection. Now, how to find out how much difference there is between one, two, three, four, five, or ten inches of air space or packing material—the difference between thick and thin outside walls, and also the difference between different kinds of packing material of different thickness.

EDWARD HASSINGER, JR.

Greenville, Wis., Feb. 17.

[Some twenty or more years ago some quite exhaustive experiments were made. It was then shown very conclusively that a dead-air space, so called, was not nearly as good as a space packed with packing material such as chaff, planer-shavings, forest leaves, or any material that will break up the circulation of air. The trouble with the so-called dead-air space is that the air is *not* dead. It comes in contact with the outside wall, which is cold, circulates over to the inner wall, which is warm, making a constant circulation carrying the cold air from the outside to the inner wall, thus making a continuous circulation. Now, the purpose of the packing material is to *break up* this circulation, so that the air *can not circulate*. There will then be a cold layer of packing material next to the outside wall, and a warm layer next to the inside wall. This matter has been tested very carefully by the builders of engines, who place packing material like asbestos between the outer and inner walls of the cylinders. The matter has been tested so thoroughly and carefully by scientific men that we do not believe there is any question that a given space containing packing-material is a great deal better than the so-called dead-air space. But a dead-air space in building-blocks is a good deal better than solid blocks, for the simple reason that a stone block will carry the cold clear through into the inner wall, where with the dead-air space the cold is not carried quite so quickly. A dead-air space is better than nothing; but if a building-block had packing material placed in those spaces it would make the building much warmer.]

We don't know whether a solid block of wood would be colder than a hollow wooden block with dead air.

In the case of a thermos bottle, there is, as you say, no air between the walls, and, of course, there can be no circulation to cool the inner wall.—ED.]

Cayuga County Convention

The annual meeting of the Cayuga Co. Beekeepers' Society, March 12, was well attended. Several speakers from abroad were present, and added interest to the occasion.

Mr. Irving Kenyon, of Camillus, N. Y., Secretary of the New York State Beekeepers' Association, gave a brief review of the fall meeting of that association, bringing out the points of interest. He also gave an address on the production of extracted honey, explaining in detail his own elaborate method, in the course of which he exhibited a device of his own invention for fastening foundation in the sections for comb honey; also an electric contrivance for imbedding wire into the foundation, and a very ingenious and rapid method of fastening the wire into the shallow frames. He uses the steam-heated uncapping-knife, and likes it very much.

Mr. Kenyon has been so successful in producing extracted honey and in marketing it at a fancy price, that it was a surprise when he incidentally remarked that he was going back to the production of comb honey.

The address of Charles Stewart, of Johnstown, N. Y., "What can beekeepers do to help the inspector?" was very practical and pointed. He said we quarantine apiaries as doctors do their patients;

but the inspector is at a disadvantage, as his patients can fly, while the doctor's can not. For this reason it is hardly fair to expect the inspector to stamp out contagious diseases in a year or so when doctors fail to do so. He called attention to the fact that the foul-brood diseases are more virulent at the start, and gradually become milder and less to be feared, as in the case of smallpox, etc., with human beings. He considered the Italian bees most immune, or best able to resist the disease, and advised Italianizing, even before the disease gets a start. One can help the inspector by writing to him on the least suspicion of any trouble in the yard, and not waiting for the inspector to look him up.

Mr. Stewart advised getting rid of old combs by melting into wax, and using full sheets of foundation. It is a paying investment, as the bees gnaw away a good part of the old combs, and the wax is thus lost.

The address of S. D. House, on hives and fixtures, was an eloquent plea for the use of the sectional hive with a short shallow frame. When one or two sections are added, the hive presents the form of a cube, which is the condition nearest to nature. If his arguments failed to convince his hearers that his hive was the best for all purposes and places, he *did* impress all with the fact that his success as a comb-honey producer is indisputable evidence that his hive is the best for his own locality under his skillful manipulation.

The convention adjourned at five o'clock, the same officers holding over.

Ithaca, N. Y.

E. D. DRESSER.

Kansas State Convention

The tenth annual meeting of the Kansas State Beekeepers' Association was held in the Commercial Club rooms, and was largely attended on February 4.

The address of welcome and transaction of reports of last year's meeting took up the greater part of the time.

On February 5 there was a large attendance at both meetings. Talks were given by Prof. George Dean and Prof. S. J. Hunter, both of which were highly appreciated by those present. Dr. G. Bohrer, of Lyons, Kansas, O. S. Mullin, of Holton, and Arthur Small, of Topeka, read a number of articles of interest to beekeepers.

The following officers were re-elected: President, P. R. Hobbie, of Dodge City; Mrs. J. D. Smith, of Troy, Vice-president; O. A. Keene, of Topeka, Secretary and Treasurer.

The meeting adjourned with a unanimous vote of thanks to the Commercial Club, after which a half-hour was spent in visiting, then to the banquet-hall, where hot biscuits and honey were served.

O. A. KEENE, Sec.

Why Some Larvæ Are Not Sealed

I have been watching my bees and their brood for a number of years for foul brood; and by doing so I find during the breeding season lots of young larvæ that the bees fail to seal; and when I look again they are gone, but others still there again. They are left until they are perfect-looking bees, only a little small. Now, what do you call it? or why do they fail to seal them or take care of them? Is it on account of stores or cold chilly weather that they get chilled for them, and die before they can attend to them? I never could catch on to it right; but it should be prevented in the spring.

Richfield, Pa.

W. S. NEUMOND.

[During certain seasons of the year, and sometimes in certain particular colonies, we find what we call "bareheaded" brood—that is to say, the bees fail to cap over or seal up the young larvæ. This may remain for a considerable time. It indicates no bad condition; in fact, so little of it occurs

that we pay very little attention to it. But what you describe is evidently of a different character. It would indicate that it was starved or chilled brood. Sometimes there is a scarcity of pollen, and the young nurse bees are not able to feed the young larvæ properly. The result is that some of them die. It is removed, and then the queen lays again in these same cells.

A sudden cold spell coming on may cause the brood at the outer edges of the cluster of bees to become chilled and die. This will be subsequently removed by the bees; and, shortly after, other young larvæ may be found in their places.

The condition described does not indicate any disease; for if there were any thing of that character you would find it spreading to other hives; and not only other hives, but all through the colony where the first cells were found.

It might be possible, however, that it is a case of sacbrood, as recently described in GLEANINGS.—Ed.]

Cube Sugar for Winter Stores

This is my fourth winter's experience with bee-keeping far enough south to winter bees in the open, in single-walled hives, in Missouri, North Carolina, and now in Alabama. Until this winter, I just laid the cubes of sugar on top of the brood frames in a pyramid with a burlap sack over it, with burlap extending out over all four sides of the hive. I then put on a super which surrounded the sugar pyramid, then I filled in the vacant spaces in the super with dry leaves, and put on the cover.

The last two winters in Alabama my plan has been more simple. I removed two combs from the side of the hive, and filled the vacancy with cube sugar, as we had some warm weather late in January. I examined all the colonies thus fed and found the bees piled all over the sugar, eating away at it as busy as hogs in a pit of corn.

Both you and Mr. Miller agree, p. 816, Dec. 15, that there is moisture in the hive. What about the bees having saliva to moisten their dry food? And how do they feed on hard candy? and I think even rock candy has been recommended for winter feed. The cube sugar will not melt nor run down on the bees if used above. And the bees will use it for brood-rearing in the spring. And, oh how nice and clean it is to feed, and how simple the problem! My experience covers territory only where it is warm enough to permit the bees to take a flight every few days. It is a boon for the South.

Later.—My weak colonies that were fed loaf sugar came through the winter safely. They not only wintered on it all right, but reared brood. Of course, when the bees could work outside I began feeding syrup.

Letohatchie, Ala.

W. N. RANDOLPH.

[While it is true that bees have a saliva, it should not be forgotten that, if they are to be confined for a period of three months on dry comb and dry cubes of sugar, without any means of getting water, there will not be very much saliva, for saliva is mainly water. But a colony in an ordinary winter repository will give off enough moisture so that the bees will have enough to make their "mouths water" when they approach a cube of dry sugar.—Ed.]

Early Spring Honey Saved for Winter Stores

In my locality we have a considerable early flow from fruit-bloom, dandelion, and willow, so that most colonies will nearly fill a shallow extracting-super from it. This early dark honey is a positive detriment when it becomes mixed with the clover, as generally happens. I have considered the plan of taking off this shallow super of early honey just before the clover flow, and reserving it for winter stores. The super could be set bodily on the hive

and left so for winter. Most of our wintering here is done on buckwheat honey, and I should like to know whether this fruit-bloom, dandelion, and willow honey, if well ripened and sealed, and finished off with buckwheat, would be safe for wintering. Buckwheat gives good results here for winter stores.

Stouffville, Ont., Feb. 15.

F. L. POLLOCK.

[We feel quite sure that the dark honey which you mention will be safe for winter stores. Whether it will be as satisfactory as stores made of sugar syrup is another question; but we rather doubt it.—Ed.]

A Package Wanted for Sending Honey by Parcel Post

We have watched GLEANINGS to see if any plan had been devised for sending honey by parcel post; but up to date, we have seen none mentioned. It would seem to us a package holding from one to 10 lbs. of honey, extracted or chunk, with a covering making it safe in the mail, could be produced profitably. We are told that honey is thus carried by post in Germany, and possibly ideas could be gotten from there.

In case of chunk honey the difficulty would be to secure an opening large enough to admit the honey, and that could be quickly and safely closed. The package ought also to be inexpensive; for while a few people will pay fancy prices they are the ones who use but little honey. The real consumers who take the bulk of the product are those who buy it as a food and not as a treat. So the price must be kept so as to be but little above what people are in the habit of paying for honey delivered. Of course, comb honey, as such, can hardly be sent in this way—at least unless the Postoffice Department handles it more carefully than the express companies do, which could hardly be expected.

THE ROCKY MOUNTAIN BEE CO.

Forsyth, Mont., Jan. 26.

[See answer to this question in the editorial department, this issue.—Ed.]

Growing Alfalfa at High Altitudes

Is it possible that bees do not work on alfalfa in high altitudes? I failed to see one bee visiting it at this point. This town of Portales is in a wide valley, and the altitude is nearly 4000 feet. If any readers of GLEANINGS have had experience in this I should like to hear from them. I fear this is a poor place for beekeeping.

Portales, N. Mex., March 2.

J. W. HOUTZ.

[We know that alfalfa grows readily in altitudes of five and six thousand feet high. We are not positive of its being grown in altitudes of seven and eight thousand, although perhaps some of our subscribers might be able to give us information on this point. But alfalfa grows very luxuriantly around Denver, and Denver is supposed to be about a mile above the level of the sea, so we see no reason why it could not be grown at an elevation of 4000 feet. Of course, alfalfa requires water; and at that elevation it might require irrigation to do well.—Ed.]

Cottonseed Meal as a Substitute for Pollen

Mrs. H. Millard, Feb. 15, page 131, recommends feeding albuminized sugar when pollen is scarce, in an experimental way. Let me suggest to her to try first feeding cottonseed meal. I have never read of any one trying the use of cottonseed meal as a substitute for pollen; but the editor suggests the use of rye meal as being more practical. It appears to me that, if rye meal were rich enough, cottonseed meal (which is much richer) would be better. By baiting your pan of cottonseed meal to attract the bees' attention, they will find it sooner.

Rocky, Okla.

KOS HURST.

Our Homes

A. I. ROOT

A BRIEF MENTION OF SOME OF THE GOOD MEN
AND WOMEN WHO EXTENDED TO ME A
HELPING HAND IN MY CHILDHOOD.

The article following was given in our local paper, the *Medina Gazette*, in answer to a request from the editor that I give him something in regard to my childhood. Before starting off for Florida I told our good people here that, in case a Home paper should not be on hand, as has happened several times during the winter, they should use this in place of it.

When I was nine or ten years old I climbed up to the top shelf of our bookcase and got hold of an old doctor book. I think the title was "Domestic Medicine" or something like that. The reason why I tackled the "doctor book" was because I had read and reread almost every thing available in that frugal home in Mogadore, Summit County, O. There was a family of seven children—three older and three younger than myself. I had read all the schoolbooks, for the younger and older ones, all the newspapers I could get hold of, the family almanac, and a good part of the dictionary. Well, the fore part of this old doctor book did not interest me particularly; but along toward the last part of it was an article on "electricity." It was almost my first glimpse of this strange force that has interested me more or less from that time to the present. This old book, among other things, told me how easily this wondrous power could be invoked by means of a roll of brimstone or a stick of sealingwax. At that early day (about 1850) what few letters were written were mostly sealed with wax. Later, wafers were used. By rubbing sealingwax or brimstone with a piece of warm woolen cloth, especially in frosty weather, I made my first acquaintance with electricity and electrical attraction and repulsion.

After I had read over and over all the doctor book had to tell me I questioned my father and mother, and everybody else, about electricity until I fear I was a nuisance. Finally an aunt of mine, who was attending "high school," informed me that her "philosophy book" told a good deal about it. It was then that I made my first acquaintance with "Parker's Natural Philosophy;" and over and over I scanned the pages that gave information in regard to this subtle element in nature. A little later on, in order to supplement the funds of our humble home we commenced to keep boarders. One of them was a schoolteacher, and another was a miller. Of course those two good men had to be "pumped dry," on electricity. Mr. Fairbanks, the school teacher, said I ought to study chemistry.

"What is chemistry?" I asked.

Well, this particular friend, whom I shall always remember, replied something like this:

"Why, my young friend, chemistry not only tells about electricity but discusses the nature of the elements of which this world is composed. I have an old chemistry somewhere that I will look up, and you may have it if you care for it."

The book was entitled "Conversations on Chemistry," or something like it. I not only devoured this book from cover to cover but a neighbor's lad of about my own age took it up with me. He lived about a quarter of a mile away, and we two each had a "laboratory" off in a shed or some basement, and the experiments we performed with our rude home-made apparatus were surprising.

This neighbor's boy was named Corwin Purdy; and when Corwin had made some "great discovery" he would run as fast as his legs would carry him after me, and we two would go back again in breathless haste. I had been trying to make a voltaic pile of copper, zinc, and moistened cloth, using the old-fashioned copper cents. But my voltaic pile did not "materialize" very much. But Corwin found an old copper teakettle, ripped it open, and hammered the sheets out flat. Then he cut them up into pieces about two inches square or more, and made his pile of copper, zinc, and cloth. These squares of woolen cloth were soaked in slightly acidulated water; and when he succeeded in getting a real electric shock he ran for me so much out of breath that he could scarcely talk.

Our craze for chemistry soon brought us in contact with the village doctors, and they loaned us a helping hand. I remember distinctly Dr. Ferguson and Dr. Parleyman. The Rev. Mr. Hughes, the minister, also encouraged us, and placed his whole extensive library at our disposal. The village miller took the *Scientific American*; and when the boy of only nine years of age wanted to "borrow" his back numbers he demurred a little. Finally he said, "Why, my young friend, if you are really going to be a reading man, I have a whole year's back numbers of the *Scientific American* bound up after a fashion, and I will loan them to you."

I have been in close touch more or less with the *Scientific American* now for more than 60 years; and I can tell you it has been worth to me a great deal by way of posting me in regard to true science and better methods of sifting the wheat from the chaff.

But chemistry and electricity were not my only craze. I seem to have been a natural explorer. I watched the hens and chickens as well as nature's display whenever there was a thunderstorm.

Let me digress a little right here. My love for books, and my extensive reading, enabled me to read, write, and spell, without giving very much thought or care to either unless it was the writing. In those old days we learned spelling in a long class, the best speller going up to the head. Well, while the other pupils were poring over their spelling-books I had no spelling-book at all. I did not need any. It seemed to be a natural gift for me to be able to spell. I not only loved books but I loved the queer crooked spelling that fixed itself in my mind without any effort. Of course, we all know about the cranks on spelling, and sometimes they can "spell" without being able to do much else. Well, on the last day of the school I was at the head as a matter of course. The trustees or directors were on hand on examination day; and after hearing me spell, one of those dignitaries made a remark something like this, pointing his finger at me:

"There's a boy who studies his spelling-book."

At this sally there was a queer smile, not only on the faces of the pupils in the class but on the teacher's face also; and I do not know but there was almost a titter among all the children. It was because they all knew that I had no spelling-book and had never looked into one during the term. Well, notwithstanding the above, I was awarded the prize—a "two-shilling piece." Nowadays it would be called a "quarter."

After school was out I told my good mother I wanted to invest my prize money in something that would grow, and finally we decided on a couple of laying hens. In those days they were only a "shilling apiece." Now, my good grandmother, who lived two miles and a half south of Mogadore,

in a big brick house, had some yellow hens which she greatly prized. Two of them had a habit of getting into the cellar kitchen and laying their eggs in the old brick oven. Of course they had to lay them outside when baking day came around. Well, I walked two miles and a half down to grandfather's, and found nobody but him at home. He sat in his chair in this old "cellar kitchen." Now, grandfather Hart and I were good friends because he was at work on a perpetual-motion machine, and I was greatly taken up with "seeing the wheels go round." I was so full of my particular enterprise that I walked up to grandpa and showed my spelling prize. I think there was a hole through it, and a red or blue ribbon was tied to the coin. I told him I wanted to swap my prize money for two laying hens. The two hens were standing in that brick-floored kitchen at the very time we were talking. He approved of my speculation, and told me if I wanted hens that would be sure to lay I had better take those two cream-colored "biddies." They were so tame I had no difficulty in getting one under each arm, and then off I started on my trip of two and a half miles. But by the time I displayed my two treasures to my good mother I was pretty tired and dusty, for the hens became heavier and heavier as I hurried along, barefooted and barelegged.*

Did the hens lay after being transferred to a new home? To be sure, they did. All the hens I have ever kept always laid. When I got down to my Florida home a year ago my flock of 50 or 60 laid only about half a dozen eggs a day; but they commenced laying, one after another (as soon as I got around), right along, until I had upward of 40 eggs from 60 hens. It was because I loved them and made friends of them.

Well, just here I am ready to introduce another friend who lent me a helping hand. He was the village schoolmaster; and let me say right here that, after my two hens got to laying nicely, a neighboring woman said she had a Black Poland hen with a brood of chicks, and they were making such a mess with her garden and flowerbed that she would sell me "the whole shooting-match" for another "two shillings." By this time I had sold eggs enough to be able to purchase the hen and brood; and, oh what a delight and joy was that mother-hen with her brood of white top-knotted Polands! From that day to this the sight of a real top-knot Poland makes my heart bound.

Well, the schoolmaster suggested I should "keep books" to see whether my poultry paid expenses instead of "eating their heads off," and hence he suggested that the latest up-to-date manner of keep-

* My! but did not grandma make a fuss when she found her two favorite biddies were gone? She said Amos must bring those two hens right straight back; but when she came to Moradore and found what a nice house and yard I had for them she changed her mind, especially when she considered it was her favorite grandchild who had appropriated the two cream-colored hens.

Even at that early age I had caught on to the secret of making the hens lay in winter; and one time in January when there were no eggs in the market, a rich man by the name of Moore sent word that he would give me 25 cents for a dozen eggs. I think the regular market price was 8 or 10 cents in those days. Well, I hurried off, full of animation and delight, with my eggs. But I did not cover them up properly, even though it was zero weather; and when I reached his home two or three of the eggs had frozen and cracked open. I thought, of course, I would not get my 25 cents, and began to cry—perhaps partly on account of the cold; but he said, "Do not cry, bub, here is your money. The eggs will be exactly as good for us, for we will keep them frozen until we want to use them." Then I wiped away the tears and rushed back home to give the hens credit, in my double-entry book-keeping.

ing accounts was double entry. By the way, this good friend also taught me penmanship, and during the winter, when eggs got up to a big price, my double-entry book-keeping was all over on one side of the ledger. It was all profit and no loss.

I might mention, as a sort of side issue, that I had an older sister who was not only bright but fairly good-looking. In fact, she taught school when she was only 15 years old, and a country school at that. Well, one day the schoolmaster, in talking to me about my chemical experiments, said he thought he would come over after school and see my "apparatus." I remember I was a good deal disappointed. I told my mother that I did not believe the schoolmaster cared very much about chemistry after all. He did not seem to notice any thing very much except that older sister I have been speaking of. After a while they were married, and, of course, all the family were expected to be present at the ceremony in the evening. But that night there was to be an "electricity show" at the Methodist church. I had already become acquainted with the professor; and the idea of my missing the show simply on account of so trifling an event (?) as the marriage of my sister was preposterous. I had always been a very obedient child; but I then and there decided "things had reached their limit." There was really a prospect of a thunderstorm right there, besides the one over at the church, unless I could be let loose at "early candle-lighting;" and so the marriage was performed before the candles were lighted instead of after.

Now, all the above looks as though I was a model boy, does it not? and I know of one little woman who may make a fuss if I do all this bragging of what a precocious youngster I was, instead of telling a little something on the other side; so, before closing let me show you that I was not much different from other "kids" of 10 years, after all. The good miller who loaned me those old copies of the *Scientific American* gave me the sweepings of the mill to feed my chickens to pay for sweeping up the mill. Well, there was sometimes a little wheat scattered on the floor; and notwithstanding all his kindness to me I was not always very conscientious about letting some good grain get mixed in with the mill dust.

Once more, the good preacher who gave me access to his library had a couple of hives of bees, and these hives had "glass drawers" on top. Some wicked boys went in after dark and pulled out one of those drawers; and as I passed by they told me what they had done, and asked me to "have some honey." Even if I was not a "thief" I was at least a "partaker," to a small extent. I am glad to tell you that my conscience troubled me about it, but not enough so as to cause me to go to the good man and confess.

Once more, the good doctor who was such a good friend of mine had a fine tree of Red Astrakhan apples near the fence. With some other boys I went there after dark and helped to pilfer his apples when he had only that one tree. It is true at this very time I was attending Sunday-school regularly, and learning "verses;" but somehow they did not seem to take hold of me at that age in a way that one of older years might suppose they ought to have done. A. I. Root.

NATIONAL "RACE SUICIDE."

And God said unto them, Be fruitful and multiply, and replenish the earth and subdue it.—GEN. 2:28.

What is the use of being patriotic, what is the use of being progressive, what is the use of fighting for one's country and nation, if there are to be no children to take

APRIL 15, 1913

our places when we are dead and gone? The above was suggested by the following brief note from my long-time friend W. P. Root:

Mr. Root:—I enclose a clipping that is too important to lose. The closing up of it is especially interesting. We are often told that in France, where light wines are used, intemperance is practically unknown; and yet here we see it threatens to exterminate the nation. Experience teaches a dear school, etc. It is worth reprinting. I found it in the *Leader* last night, Nov. 24.

Below is the clipping. Read it and ponder. Is there any moral to it for our own United States of America?

FRANCE HELD MENACED BY DECREASE IN BIRTHS.
RECORD SHOWS 742,114 BABIES IN 1911—100,000 LESS THAN IN 1901, AND EXCEEDED BY . . . DEATHS; LEGISLATION SOUGHT TO BALK DEPOPULATION.

PARIS, France 23.—The birth rate of France was lower by more than 100,000 in 1911 than in 1901. Louis Klotz, minister of finance, announcing this fact to the commission on depopulation at its first session to-day, said:

"Military inferiority, economic inferiority, and the diminution of the power of France in the world, will sooner or later be the inevitable consequences of the sterility of our nation."

The number of births last year, according to M. Klotz, was only 742,114 in the whole of France, against 857,274 a decade ago. In 1907 and 1911, he said, the deaths actually exceeded the births. This was, he continued, a sad state of things, and a great danger to the country, placing France in a situation of inferiority in comparison with the other great nations. The lower birth rate, while a perplexing phenomenon among all civilized peoples, was, the minister said, a greater problem in France than elsewhere.

The births exceeded the deaths in 1910 in Germany by 879,113; in Austria-Hungary by 573,520; in Great Britain by 413,779; and in Italy by 461,771; but in France by only 71,418.

In the course of further remarks, M. Klotz reviewed the ineffective government and private measures taken in the past to help parents of large families to limit the hours of work of women about to become mothers, and to reduce infant mortality. It was necessary, he said, to study these and other factors, including the evil effects of alcohol. The relation of drunkenness to infant mortality would, he declared, in future be studied in every part of France.

High-pressure Gardening

DASHEEN UP TO DATE.

At this date, March 24, some of my dasheens, planted about January 1, are nearly two feet high, with leaves a foot long and eight inches wide; and I find the plants are much the largest at the lower end of the row where the ground is a dark mucky sand, and quite moist, although the plants are almost over a tile drain. I am sure our readers will be interested in the two following letters, especially the first, from the Department of Agriculture.

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY.
Foreign Seed and Plant Introduction.

Washington, D. C., March 19, 1913.

Mr. A. I. Root:—Your letter of March 1 was received some days ago, and we are glad to note that you are so well pleased with the dasheen. I thank you very much for the proof sheets of GLEANINGS, in which your article concerning the dasheen appeared. I was personally much interested in the part of the article that preceded the one on the dasheen.

In accordance with your desire we have arranged to send you from our station at Brooksville, Florida, seven pounds of dasheens under our number 15395. A sheet of cultural directions is herewith enclosed.

Very truly yours,

R. A. YOUNG, Scientific Assistant.

Mr. A. I. Root:—In response to your recent communication regarding dasheens I will say that our company has a quantity of dasheens for planting this season; but we have not figured on selling very many, as they are in demand here. Last fall we built a warehouse for them, and have been keeping them stored, and they are now in good shape. It would require about five bushels to plant one-fourth acre. We could spare you five bushels at \$2.00 per

bushel, f. o. b. Brooksville, for seed. Less quantities, \$2.50 per bushel.

BROOKSVILLE DEVELOPMENT CO.
Brooksville, Fla., March 19.

I was agreeably surprised to find the price already as low as \$2.00 per bushel. As Irish potatoes are almost if not quite that at retail here now, it is no wonder that many families at Brooksville are using dasheen in place of potatoes. Our good friend Irving Keek, who has just paid us a visit, says Dr. Kellogg, of Battle Creek Sanitarium, has just bought a *carload* at Brooksville, for their invalids and guests. Now, with all this great excitement going on, how is it possible no great seedsmen as yet advertise dasheen?

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY.
Office of Foreign Seed and Plant Introduction.
CULTURE OF THE DASHEEN.

The dasheen requires rich sandy soil, very moist, but well drained. The plants will not be greatly injured by occasional flooding of the land for a short period. Such lands as the so-called hammock lands of Florida are especially adapted for the cultivation of this crop. Any low-lying, sandy lands fairly well drained, but still too wet for general field crops, can be used to advantage. On these low lands it would be advisable to plant on ridges.

For best results a liberal amount of well-rotted stable manure should be mixed with the soil. Where the soil is very sandy, it is well to add a fertilizer rich in potash. Planting should be done as early in the spring as conditions of soil and climate will permit. This may be as early as the first of February in south Florida, and as late as the middle of March or the first of April in the Carolinas.

For field culture the tubers are planted, singly

and entire, from two to three inches deep in hills at a distance of three feet, in rows four feet apart. This will permit horse cultivation. During the summer, in cultivation the soil should be gradually drawn to the plants and the plants kept free from weeds. They usually require little cultivation after becoming large enough to shade the ground. Well-grown plants will reach a height of $4\frac{1}{2}$ to 6 feet or more in midsummer.

The crop matures in about seven months, although the tubers can be utilized for home use in six months or less from planting. Harvesting of the main crop may be deferred a month or two if desired; but if it is to be done at one time, in order to have warm dry weather for the dasheens to dry properly on the ground it should not be delayed till danger of frost. Maturity of the crop is usually indicated by a partial dying-back of the plants some time in October. It will sometimes prove advantageous, in practically frost-free localities, or where the roots can be protected, to leave them in the ground until wanted for use or until spring.

A ten-inch plow has proved satisfactory for turning up the plants when the area grown is large enough to justify its use. The plants are then grasped by the tops, and the clumps thoroughly shaken to dislodge as much of the soil as possible. They can then be broken apart by means of the tops, and, in dry weather, the tubers, with tops still attached, be left on the ground to dry for 4 to 6 days. The tubers should not in any case be exposed to frost.

Dasheens should be stored in a dry place of moderate temperature where the air can circulate freely among them, or they may be placed in dry sand or earth.

Wesley and I are now as busy as bees getting that quarter-acre ready for the tubers; and to make room we had to dig the wonderful Red Triumph potatoes I told you about. They didn't go all to vines, as Mrs. Root feared—not much. We ate and gave the neighbors quite a few, and have just sold three bushels of great beauties at \$1.50 per bushel. Poultry manure did it mostly, assisted by a damp soil that holds moisture, even right over the tile drain; and, thanks to a kind Providence, no frost but plenty of rain.

MY POTATO STORY.

A year ago, or perhaps a little more, you remember that I had a good deal to say about growing potatoes in the back yard. I said you could not only keep chickens in the back yard so as to help out quite considerably, but you could also grow potatoes; but, of course, I didn't mean that you could grow potatoes and chickens in the same yard. When I got home to Medina last spring I undertook to "practice" what I had been "preaching;" but although my ground was well underdrained, the exceeding wetness of last summer hindered largely. Another thing, I couldn't get any early potatoes to plant. After exhausting attempts in our neighborhood I sent to one of the leading seedsmen in Cleveland and told him to get me some extra-early potatoes—

Early Ohio or Bliss Triumph—if possible. The only answer they gave was to get me a bushel of *Early Rose*, and *these* had to be shipped by express from away up in Michigan. Just think of it, will you?—sending to Michigan for potatoes, and paying \$2.00 a bushel and express charges, and then being unable to get any thing better than *Early Rose*! Although the *Early Rose* was not much of a success we decided to bring some of them along with us when we came down to our Florida home, about the first of November. While potatoes were then 40 cents a bushel in Ohio they were 40 cents a peck here in Florida.

The potatoes here in Florida offered for sale in the groceries were not only 40 cents a peck, but they were of a very poor quality at that. In fact, Mrs. Root had sometimes to pare off and throw away almost one-half of the peck of potatoes for table use that cost us 40 cents.

Now, with this condition of affairs I declared I would plant some potatoes just as soon as I could get a piece of ground ready in the garden; but then the same question came up again, "Where can I get seed that will grow?" Potatoes brought down from the North, and planted here in Florida in November or December, of course, would not grow at all. As we had this same condition of affairs a year ago I decided that I would come out ahead this year any way. Before I left here last April we dug two or three bushels of nice Triumph potatoes and packed them in dry sand in our incubator cellar, having been told they would keep nicely this way, and be sprouted all ready to plant when I got back in the fall. It would have turned out all right had not the rats discovered the potatoes; and when we got back here there was only a great pile of worthless skins. The rats had eaten them all. I ought to have had sense enough to surround my potatoes buried in dry sand with inch-mesh poultry netting; but we shall only have to live and learn a little. It was along in December before I was enabled to get any potatoes suitable for planting at once in Florida. I scanned the papers and catalogs; but along toward the middle of December my good friend down at the dock, Mr. S. C. Corwin, advertised Triumph potatoes ready to plant. I went down at once and got about a bushel. The price, of course, was pretty well up—\$2.00 a bushel. They had just begun to show sprouts, and were just right to plant. I was so much in a hurry to get my potatoes to growing that I planted half a dozen hills after dark.

Now, before I proceed to tell you what

happened to those half-dozen hills, I want you to listen carefully to the following:

Some two or three years ago I became so well aware of the need of underdrainage here in Florida that I spent about \$25.00 in hard-burned tile (I think brought from away up in Georgia) to underdrain a part of my garden. Well, when I got here in November I found a tremendous growth of grass and weeds all over this garden spot where I had laid the tiles. I said to Wesley, "Wesley, I don't suppose it is possible for you to spade under all this trash."

He replied, "Oh! yes, sir. I can spade it all under nice and clean if you want to have it go in."

I said, "Go ahead."

Well, I planted these half-dozen hills of potatoes right where he turned under all that grass. It had been spaded perhaps three or four weeks, and we had plenty of rain, so it was well under the work of decay. You remember what I said about planting whole potatoes to get some extra early. Well, in order to *practice* what I have been preaching I selected half a dozen great big nice Bliss Triumph potatoes, with sprouts just showing as I told you, and planted them right over the underdrain, and right in the midst of this nice decaying grass and trash. In a few days they were up, and, oh how they did grow! I called in my friends and neighbors, and the visitors that came from the far North, and showed them my potato-patch. The vines were not only fine and luxuriant, but the leaves were so much larger than anybody ever saw potato leaves before, that people hardly knew they *were* potatoes. As I told you before, no sort of potato-bug or flea-beetle marred the beautiful nice green foliage. My neighbor Rood, who does every thing on "high-pressure" principle, said that *he* had never seen any better potatoes than mine. After they had been planted about five weeks, another neighbor (and also another bee-keeper) came and took a look at them, and he said, "Why, Mr. Root, there are potatoes down under those vines already." I told him I guessed not—that it wasn't quite time for potatoes; and, besides, no blossoms had showed themselves yet. But he stooped over and pulled back the dirt, and showed me potatoes as big as hens' eggs. When they had been planted six weeks we had potatoes as big as anybody would care for for table use. I haven't dug any whole hills yet, but I tell you there is going to be a tremendous yield. Mrs. Root kept cautioning me all the time that they were going to be all *vines* and no potatoes; but I tell you the ground is popping up on all sides, and

there is no mistake about the potatoes as well as the vines. I want to emphasize again the importance of turning under decaying hay, leaves, or trash of that kind. This gives the potatoes a chance to develop in their natural beautiful shape without being crowded and squeezed by hard unyielding soil.

Well, after planting the few potatoes we proceeded to fix the ground and put in more every few days. At first I began to fear that the immense growth and yield were owing to the fact that we had picked on a particular spot where there seemed to be partial—I might almost say natural—irrigation. But since then I have been trying these same Bliss Triumph potatoes at different points all over our five acres, and by the alligator cave I have some that begin to look now almost as promising as those up here near the house. You may inquire in regard to the fertilizer. Well, we put on only a very little fertilizer; but the spot where these immense potatoes are growing was where the poultry had been in the habit of scratching and digging and dusting for perhaps several summers past. This has probably much to do with it. Of course, other people are *now* putting new potatoes on the market, heaped up before the windows in our groceries; but the price, instead of being 40 cents a peck, is now 50 cents a peck, because they are new potatoes, the first put on the market.

Now a word to those who are writing me almost daily to know whether they can come down to Florida and make a living growing celery, grapefruit, oranges, etc. I think it is very unlikely that one brought up in the North can come down here and make it pay growing southern crops—at least not until he has had practice here and learned by experience; but I do think there are thousands of people who could come down here to Florida and make a good living growing *potatoes* if they will only take the pains to *do things right*, and take advantage of modern methods and discoveries. Let me go over them briefly.

You will first have to purchase tiles and get your ground thoroughly underdrained. The cement tiles that are used largely in many places don't seem to answer here. There is something in our Florida soil that rots or disintegrates them. I have lost quite a little money, and my neighbor Rood a good deal more, in investing in cement tiles. Secondly, you must have humus to grow potatoes here in this Florida sand. Thousands of people are burning up the trash in order to clear off their ground; but according to the Florida Experiment

Station it would be worth *nine times* as much if turned under and rotted the way I described in growing my potatoes. Again, you must have good seed, and you must give it good care. If you can grow potatoes successfully in your back yard or garden up north I think you ought to be able to grow them successfully here in Florida. I suppose you are well aware that hundreds of carloads of potatoes and other things are shipped daily from Florida up into the North. Just a little more about good seed.

When friend Corwin put his notice in the paper about "seed potatoes ready to plant" he also stated that this seed had been grown expressly for him for this *particular* season of the year. In order to have potatoes ready to plant, say in November, December, and even in January, they must be grown somewhere at a season of the year so they will begin to sprout and be ready to grow about the time when they are to be planted. There are certain seedsmen in the South who make it a part of their business to be able to supply potatoes ready to plant in the months I have mentioned. You must have the right kind of seed. If you don't you will fail. So far as I know there is nothing better in sight at the present time than the Red Triumph that I have spoken of. It is a most handsome potato; and when they are thoroughly ripe it is about equal in quality to any early potato we have. The Early Ohio might do as well down here, although I have never been able to try it. Let me mention right here that some years ago I happened to be present at a farmers' institute in a rural district, and a discussion was going around in regard to growing potatoes; and the farmers there in Ohio thought if they could be sure of 40 cents a bushel they were having a pretty good thing in potato-growing. As I had published a book on potatoes (or, at least, my good friend Terry and myself had put out the book), somebody inquired for A. I. Root. As I rose to speak I told the good people that I was afraid I wasn't enough of a farmer to be able to grow potatoes, and make it pay at 40 cents a bushel. "But," added I, "if you will give me 40 cents a *peck* I think I could get along right smart." This statement awakened quite a little uproar.

Dear friends, almost every one of you whose eyes rest on these pages, no matter where you live, can get 40 cents a peck for your potatoes if you set about it right now to get ready. Spread your seed potatoes out in the sun, at least a few of them, as many as you may want, in some place where they won't freeze, and induce them to put

out short stubby sprouts as quickly as possible. Then I think it would pay you to have a few cold-frame sash. Along the last of this month you can put the potatoes out pretty close together under glass; and along in March, in many localities, you can get them out under good rich ground prepared as I have outlined in this potato story, and have them ready to grow whenever the weather will permit. Should there come a frost it is an easy matter to give at least a few potatoes a little protection. The grain-sacks that are a drug here in Florida answer every purpose nicely. Rip up the seams and spread the bags over the potatoes just coming through the ground, and they will ward off considerable frost. When your potatoes are ready for market they will be quite a little ahead of those shipped from away down here in Florida, or Bermuda, or other lands.

About the nicest way to cook new potatoes, especially those that are only partially matured, is to boil them with green peas. That is just what we are having for dinner almost every day just now. Don't undertake to dig the *whole hill* of potatoes when they get so as to be fit for table use. Push your hand down through the hill in that rotted straw and hay that I mentioned, and pull out the potatoes as you happen to need them, and let the vines grow right on. Potatoes planted very early are very unlikely to be troubled with potato-bugs or flea-beetles, or any thing of that kind. Teach the children the trick of growing stuff under glass and they will soon not only be a great help, but it will be an excellent part of their education. As I write this the "corn-growing" boys are being discussed, especially in regard to their trip to Washington, as provided by the different States; and Florida is just now discussing the matter of offering her boys not only a premium but a trip to Washington also, for growing fields of corn that beat any thing their "daddies" ever saw or heard of. Now, let us all offer an inducement to get the boys to growing potatoes; and why not let the girls share in this industrial education as well? This has been taken up by agricultural papers, and it will be very strange if we don't find some girls who are just as smart as the boys, even in growing corn, potatoes, and other things.

COLORADO APPLES, ETC., BY PARCEL POST;
SOMETHING FROM OUR OLD FRIEND,

J. A. GREEN

Mr. A. I. Root:—I regret that our personal acquaintance has not been as intimate of late years as it was when I lived in Illinois and gave all my time to beekeeping, so that we occasionally met at

conventions. However, I have read with interest all your writings, and have not forgotten the old times. I am now engaged to a considerable extent in the fruit business, so I have been interested in your "apple talks" within the last several months. I have been packing and shipping apples for several days, and it occurred to me that you might like to see some samples of the apples we grow in Colorado, so I packed and shipped you to-day by parcel post a few apples. You will find the papers in which they are wrapped stamped with the name of the variety. First there is the Arkansas Black. We do not call this a very good eating apple; but its high color makes it sell very well—highest of all our apples this year, and it is also a very good keeper. I have kept them over a year in good condition in our cellar. Then there is the White Winter Pearmain. This, when at its best, is my favorite eating apple, though these are somewhat past their prime.

Then comes the Winesap, which is one of our principal varieties. A collection of Colorado apples would be incomplete without the Jonathan, so I send some of these, also the Grimes Golden, though I had nothing left but culls in either of these varieties. Of course we raise a great number of varieties here,

though there are only a few that are planted any more. Jonathan, Winesap, and Gano are about all that are planted any more, and I do not think many Ganos will be planted hereafter.

I should be glad if you could let me know how the apples stand their long trip. I have been wondering if the parcel post would help us to solve the problem of getting our apples to the consumer, and getting rid of the excessive profits charged by the middlemen.

JAMES A. GREEN.

Grand Junction, Colo., March 10.

The apples came to hand in excellent condition; but the postage was 72 cts. on 15 apples—not a very good showing for parcel post from *Colorado to Florida*. The wooden box (to make them safe) weighed 2 lbs., and the 15 apples 5 lbs. The Arkansas Black is a most beautiful apple, very hard and crisp, but not quite equal in flavor to the justly celebrated Winesap. The Delicious apple I have mentioned in a former article kept perfectly until March.

Poultry Department

THE HEN'S NEST AND NEST EGG.

On page 426 for GLEANINGS for July 1, 1912, I gave you sketches of a hen's nest as I would have it for our convergent poultry-yard. Well, I have just completed a series of six nests after this plan, and I want to tell you something of how they work. Before I had built my nests, the hens had been laying in a pine box in their roosting-house covered with burlap, by means of some barrel-hoops nailed to the sides of the box, and curved over the top. This particular nest suited them so well that six or a dozen hens were laying in it every day. After I put in my new nests with the dark alley for them to go through, with some nests nicely fixed with dried grass and nest eggs, the hens, when they were ready to lay, climbed up the little ladder and looked the nests over and spent quite a little time investigating, but they did not lay any eggs. Finally I noticed in one of the poultry journals that the hens had a great preference for laying where there is a nest full of eggs already, as their natural desire seemed to be to accumulate a nest full before wanting to sit. So I put several nest eggs in the new nest; but they went in, investigated, and spent some time cackling, but did not lay any eggs. Finally one day I took three warm eggs, just laid, from their old nest in the poultry-house, and put them into the new house along with the china nest egg. This seemed to have the desired effect, for they went to work and laid three or four eggs during the day in that same nest.

Now, you will notice I used the expression "china nest egg;" but, if I am correct,

when you go to almost any of the stores now and ask them if they have china nest eggs they reply, "Oh, yes!" and give you some eggs made of white glass. They seem to be getting thinner and smaller, until I should exceedingly wonder if any sensible hen would think of calling that a nest egg. They are also made so light that the hens knock them off the nest; and down here in Florida the skunks and opossums, when they come around at night to see if any choice eggs have been left in the nest, have the habit of biting them and crushing them to pieces. In fact, one moonlight night I caught a skunk snapping an egg around the poultry-yard and trying to bite it. When it would bounce and fly off he would try again. He seemed very much disgusted to find an egg so smooth and slippery that he could not crush it and get the richness inside. I have in vain asked keepers of poultry supplies for some better substitute. Of course we have such eggs advertised, and I bought quite a number of them; but they do not seem to be much better than the glass egg. They are heavier, and stay in the nest better; but when skunks or other vermin get hold of them they are easily crushed. I have an impression that some of the hens, discovering they are made of chalk or lime, or something of that sort, have been pecking them to pieces themselves in order to get material to make eggs, especially if they do not happen to be well supplied with lime or oyster-shells.

I do not like the wooden eggs (such as The A. I. Root Company used to sell years ago), because they are so hard to keep

clean. The paint or varnish, or whatever is used, very soon gets soiled, and the eggs get to be unsightly, and, very likely, unsanitary. There used to be years ago a genuine porcelain egg that was just about as heavy as a hen's egg, and was proof against all these troubles that I have mentioned. Can anybody tell me where I can get an egg that is porcelain—really porcelain in something besides name? Now, my new hens' nests, which I have taken so much pains with, have proved all right except in one respect. When there is a very hot day, for instance, the hot sun shining right direct almost at right angles on this lid that is to be raised up, makes it, I suppose, almost unbearable inside, because on such days I notice the hens going back to their old nests, and all piled into one nest, or else they stand and wait for their comrades to get through and give them their turn. Of course, I might have trees to shade my hens' nests; but it would be a little difficult to have shade-trees so the sun would not strike right squarely against some of the nests at a certain time of the day. And I am convinced that, a good many times, the hens desert their nests and go over to the bushes to lay just because the nests are too hot in the middle of the day in this southern clime. It is certainly one very great drawback to have the hens go off in the bushes, under the palmettos, or among this luxuriant foliage here in our semi-tropical land, and steal their nests. Eggs from stolen nests are not fresh, and seldom fit for market. Our government has been passing some strenuous laws in regard to taking eggs to market that were not healthful or suitable for the market. All such eggs can be used at home; but when too many of the hens get to going out among the bushes it gets to be a serious matter. Some poultrymen, I know, take the ground that there is no need of nest eggs of any sort; but they certainly have a very great influence in getting the hens to lay *where* you want them to instead of in some out-of-the-way place where the eggs may never be found at all. Where hens are confined, and do not have unlimited range, it isn't so very important to have nest eggs. But I want my hens to enjoy themselves and be happy, and I want them also to lay where I "elect."

Since the above was written neighbor Abbot suggests that my "convergent nest-box" needs more ventilation. In my efforts to give the biddies *privacy* I forgot *fresh air*. On cloudy days, or in cool weather, the nests are all right; but during sunny days I am leaving the lids propped up a couple of inches.

ROOFLESS POULTRY-HOUSES IN FLORIDA, ETC.

Mr. Root:—In the Poultry Department of GLEANINGS for Jan. 1, F. M. Baldwin strongly advocates roofless coops for poultry in Florida. I would advise new-comers intending to keep chickens not to follow such advice too blindly. Use common sense. Mr. B. claims that poultry are not bothered with vermin in roofless coops. May be not, but there are other ways of getting rid of vermin than drenching the fowls with rain water two or three times a week. When we had dirt floors in our coops, chiggers were a terrible pest. We put in board floors, and have not seen a chigger in years. A roofless coop would be a standing invitation to all the varmints in the neighborhood to come and help themselves. All the coons, possums, foxes, and wildcats in that vicinity would camp around that coop till the last hen was gone. Wire poultry fencing does not always keep them out. F. H. CHESEBRO.

Boca Raton, Fla., Jan. 21.

My good friend, either you have not been long with us or you have read GLEANINGS carelessly. The term "roofless" does not mean there is nothing overhead to keep out "varmints." On the contrary, I think most of the roosting-places are covered with poultry-netting. The first two years we were in our present Florida home our poultry roosted in the trees, and had no houses at all; and my yield of eggs was as good as with houses. The reason why I changed was the difficulty of getting the fowls, when wanted, and some trouble on moonlight nights from owls. We have had no insects of any kind in our roosting-places since we commenced sweeping up the droppings every morning.

CONVERGENT POULTRY-RUNS ACROSS THE WATER, AND SOME OTHER THINGS.

Dear Sir:—I wrote you, Sept. 9, about the convergent poultry-runs, and you published it on Nov. 15, since when I have not seen any thing further on the matter; so I thought you would like to hear the opinion held over on this side.

The chief drawback seems to be in the great length of the run when compared with the width, as the fowls are not inclined to keep the grass down at any distance from the house; and to overcome this Mr. Wright gives a plan of eight houses, sheds, and runs.

Personally I prefer the colony system, which Mr. Wright credits to Mr. Stoddard.

I am afraid you missed the point in the leaflet taken from the Mark Lane *Express* about lime. Although it was printed in 1910 it was an article on farming in the 16th century in England, and went to show that the old timers knew that lime was good for clovers. Lime and salt are the two oldest artificial manures in existence, and are largely used in this country as well as seaweed.

I was much pleased to see in the Jan. 15th issue J. E. Crane's remarks about the good old blacks. All the other "Gleaners" seem to think them of little value; but I can assure you that I have had Italians direct from Italy and that they can't gather honey as do the blacks, and they are not half as good at wintering.

W. A. TEARE.

Ballashellan, Ballabeg, Isle of Man.